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Social Science Perspectives on Tobacco Policy

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Phyllis A. Katz, PhD

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Social Science Perspectives on Tobacco Policy

Issue Editor: Bryan Gibson

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From the Editor

With this first issue of Volume 53, we carry out a long tradition of continuity and change. At first glance, everything will seem quite new. First of all, I am a new editor, grateful to my predecessor, Dan Perlman, for his hard work and maintenance of the high levels of quality that our readers have come to expect. Second, we have a new publisher, and look forward to many years of fruitful cooperation with Blackwell. Third, we have a new and attractive cover, which we hope communicates both our renewed vigor and excitement.

Yet with all of this, we trust that our dedicated readers will recognize that this issue represents, as always, the intellectual heart of the Society for the Psychological Study of Social Issues. While it is both fitting and necessary that the content of the social issues addressed in this *Journal* changes over the decades, the current authors and editorial board bring to each topic the same degree of concern for improvement of the human condition and, hopefully, the same scientific excellence that SPSSI began with.

I would like to thank my excellent (and overworked) editors for their assistance in putting together this and the subsequent issues during my editorship.

This first issue on smoking behavior might not have been considered a social issue when this *Journal* was launched over 50 years ago. But, as you will soon see, it is an issue that currently intersects many areas of interest to SPSSI, including social science, public policy, health, and civil liberties.

As you know, the topics for *JSI* issues come from the scientific community, and are, therefore, reflective of current interests. We are always interested in topic suggestions in any form, from a phrase or an idea to a well-worked-out proposal. We also are interested in getting your reactions to what does get put into print, and I hope to start a "Letters to the Editor" section, if we hear frequently enough from you.

So please share in the excitement of launching yet another new phase of an old tradition. Let me hear from you—with comments, ideas, letters, proposals, critiques—all that our devoted and intelligent readers are capable of. I look forward to your communications.

Phyllis A. Katz

Journal of Social Issues, Vol. 53, No. 1, 1997, pp. 3–11

An Introduction to the Controversy Over Tobacco

Bryan Gibson
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The tobacco industry has a long history of denying any harmful effects produced by its products. This strategy was first developed to deny any health risks associated with smoking, and has recently been extended to the denial of the risks of environmental tobacco smoke (ETS), the addictive nature of nicotine, and the targeting of adolescents by tobacco advertisements. This has served to divert discussion of how society should address the risks of tobacco use to whether society should address tobacco use at all. If we move past these diversions and consider how society should address tobacco risks, the social sciences in general and psychology in particular have a number of insights regarding how to answer the question. The purpose of this issue of JSI is to examine some of these perspectives in an attempt to suggest how we should approach the important question of how to deal with tobacco use in our society.

Tobacco in the United States is big business. There are about 45 million tobacco users in the United States, and they generate approximately $55 billion in sales of tobacco products annually (Kluger, 1996). How are tobacco companies able to continue making such enormous profits when there is such overwhelming evidence that use of their product can be fatal? One answer is provided by noting the political clout that such economic success can purchase. Tobacco companies employ large numbers of people in the American South, and this creates a significant pro-tobacco constituency. In addition, tobacco companies have used their economic power to successfully work the political system. It is the rare congressional representative or senator who can afford to turn down campaign contributions from the tobacco industry. Furthermore, pro-tobacco lobbyists are a common sight in Washington. In addition to this economic power, the tobacco industry has effectively utilized a

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strategy of denial in its public relations operations. This denial has been extensive when it comes to the medical evidence regarding the dangers of tobacco.

That the use of tobacco products can lead to a wide array of negative health consequences has been clearly established in medical literature. From early epidemiological studies identifying a relationship between lung cancer and smoking (Levin, Goldstein, & Gerhardt, 1950; Wynder & Graham, 1950), to the first report of cancer in laboratory animals produced from cigarette tars (Wynder, Graham, & Croninger, 1953), to the reports of the Surgeon General (USDHHS, 1964; USDHHS, 1989), the progress of medical science in identifying smoking as a health hazard has been steady and unwavering. Taken as a whole, this literature identifies smoking as a risk factor in the development of lung cancer, emphysema, heart disease, and a host of other health problems (USDHHS, 1989). This increased risk of disease translates directly into a greater risk of premature death. The use of tobacco products contributes to 434,000 deaths annually in the United States alone (Centers for Disease Control, 1993). In addition, the Centers for Disease Control and Prevention have summarized research suggesting that an additional 50,000 deaths per year are directly attributable to the effects of second-hand smoke (also known as environmental tobacco smoke, or ETS; Centers for Disease Control, 1993). As results such as these have gained a greater foothold in the medical literature, there has been an increasing willingness on the part of government agencies and places of business to restrict smoking in public areas (Jacobson, Wasserman, & Raube, 1992). As one might expect, the tobacco industry has attempted to protect its self-interest by putting forth considerable effort to limit the scope of these restrictions.

The main focus of these efforts has been an attempt to discredit the foundation of medical research on which these restrictions rest. The tobacco industry has a long history of making dubious claims regarding the health consequences (or lack thereof) of its products. These claims began in response to the early research linking cigarette smoking to cancer. For example, in 1953, the year of publication of the Wynder, Graham, and Croninger report identifying tobacco tars as causal agents in the development of cancer in laboratory animals, the American Brands tobacco company included the following statement in its annual report:

> Today, after reviewing extensive research of many other professional groups, our Research Department, as it has consistently reported from the beginning, says that proof that cigarette smoking causes lung cancer is lacking. In fact the cause of this disease is still unknown. Accusations without proof in the past have not prevailed. Thus, it appears that this factor should be of diminishing significance (as quoted by Miles, 1982, p. 60).

Although these types of disclaimers were relatively common for the decade from 1953 to 1963, claims from the tobacco industry that smoking was unrelated to cancer decreased dramatically after the original Surgeon General's report in 1964 (Troyer & Markle, 1983). The weight of the medical evidence eventually became too heavy for the tobacco industry to bear, and it temporarily abandoned denial as a tactic to discredit medical research. This trend, however, has recently been re-

versed, as the tobacco industry has attempted to protect itself from the implications of more recent research regarding the dangers of ETS and the addictive qualities of nicotine. Given that the rationale for restricting public smoking is based on the potential for harm to nonsmokers, it is not surprising that findings suggesting that ETS poses a health risk to nonsmokers have become the target of much of the industry's recent propaganda efforts. For example, in a prepared statement to the congressional subcommittee on clean air and nuclear regulation, Christopher Coggins, a research toxicologist for the R. J. Reynolds Company, stated that:

> Viewed objectively, the EPA's conclusions about ETS are based on weak and contradictory evidence and selective arguments. The EPA's approach, much less its conclusions, would not withstand real scientific peer review. The EPA report simply does not provide a sound basis for public policy initiatives (*Assessing the Effects of Environmental Tobacco Smoke*, 1994, p. 80).

One wonders how Dr. Coggins defines "objectively," given that his salary is paid by the sale of tobacco products. In addition to providing statements such as this to governmental bodies, the tobacco industry has also been generous in funding authors who are sympathetic to tobacco interests and who are willing to state that the connection between ETS and negative health outcomes has not yet been convincingly demonstrated (see Ecobichon & Wu, 1990; Tollison, 1988).

Another prong in the tobacco industry's attack on basic medical research has been its attempt to discredit the conclusion that nicotine is an addictive drug. In testimony before the congressional subcommittee on health and the environment, William I. Campbell, the president of Philip Morris, stated that:

> Cigarette smoking is not addictive. During the March 25th hearing, Commissioner Kessler and members of the subcommittee contended that nicotine is an addictive drug, and, therefore, smokers are drug addicts. I strenuously object to that premise. I strenuously object to that conclusion (*Regulation of Tobacco Products*, 1994, pp. 544–545).

In a prepared statement to the same congressional subcommittee, James W. Johnston, CEO of the R. J. Reynolds Tobacco Company, states that:

> Dr. Kessler defined "addiction" in terms of four elements: Compulsive use; psychoactive effect; reinforcing behavior; and withdrawal symptoms. When each of these elements is carefully analyzed in an unbiased manner, it becomes clear that cigarette smoking is no more "addictive" than coffee, tea, or Twinkies (*Regulation of Tobacco Products*, 1994, p. 579).

These protestations that nicotine is not an addictive drug, however, are less convincing when one considers the content of internal documents from the tobacco industry itself. The text of one such document was quoted to the same congressional subcommittee by David Kessler:

> Think of the cigarette pack as a storage container for a day's supply of nicotine. Think of the cigarette as a dispenser for a dose unit of nicotine. Think of a puff of smoke as the vehicle for nicotine. Smoke is beyond question the most optimized vehicle of nicotine and the cigarette the most optimized dispenser of smoke (*Regulation of Tobacco Products*, 1994, pp. 29–30).

Other tobacco industry documents have been uncovered that provide further evidence that the industry was well aware of the addictive qualities of nicotine. Thus, it seems clear that, as with the original medical research on the harmful effects of smoking, the tobacco industry's strategy is to cast doubt on the effects of ETS and the addictive nature of nicotine through any means available.

Perhaps in response to the agenda set by the tobacco industry, organizations supporting restrictions on tobacco have responded by debating the validity of the medical evidence that has been attacked by the tobacco industry. This is certainly a valid response to the unfounded claims of the tobacco industry regarding the benign nature of ETS or the lack of addictive properties of nicotine. However, it has served to shift the focus of the debate from how our society should deal with tobacco use to whether our society should deal with tobacco use at all. This would seem to suit the needs of the tobacco industry well. By shifting the focus of the debate to whether ETS is harmful and whether nicotine is an addictive substance, the industry has attempted to create doubt about the necessity of societal strictures on tobacco use. The attempt to cast doubt over ETS and nicotine is the same strategy used by the industry in the 1950s and early 1960s to deal with the question of the carcinogenic nature of tobacco, and it is the same strategy used in the 1980s and 1990s to deal with the question of the industry targeting the teen market (see Pierce & Gilpin, 1995; Pollay, 1995).

The general orientation of the authors contributing to this issue is that the data are in, and there is no longer room for doubt regarding the negative health consequences of ETS, the addictive nature of nicotine, the strategy of the tobacco industry to target the teen market, and any of a number of other questions on which the tobacco industry has attempted to cast doubt. There is an underlying agreement among the authors that the costs of tobacco use are high. Along with the physical costs to the individual, there are a wide variety of subsidiary costs. For example, there are emotional costs to families suffering through what is typically an extended illness of a loved one who has developed cancer, emphysema, or heart disease because of his or her tobacco habit. There are monetary costs as well. These costs are felt by businesses, which lose more sick days and productivity from smoking employees than from nonsmoking employees (Weis, 1984). In addition, monetary costs are borne by the insurance carriers of the individuals stricken by tobacco-related illness or by Medicare or Medicaid coverage if the individual has no health insurance (Centers for Disease Control, 1994). These costs are then passed along to the general public in the form of higher health care costs for everyone.

Given this general orientation, therefore, the articles in this issue of *JSI* all deal in some way with the question of how society should address the problem of tobacco use. The social sciences in general and psychology in particular can provide data-based opinions on a wide variety of issues related to tobacco and how to deal with the problems posed by tobacco. The purpose of the current *JSI* issue is to draw

together some of these perspectives and to evaluate the implications of this body of knowledge for decisions regarding tobacco use in our society.

Organization of the Issue

Despite the general agreement of the authors regarding these issues, each article takes a different approach to answering the question of how to achieve this goal. The diversity of strategies used by the authors to address questions of tobacco use is a testament to the many levels on which the controversy over tobacco use has touched our society. In order to provide some coherence to the ideas presented here, the issue has been divided into three sections: (1) Determinants of Tobacco Use; (2) Controversy and Opposition; and (3) Interventions to Control Tobacco Use.

Determinants of Tobacco Use

Despite the overwhelming evidence that smoking is harmful and the seemingly widespread availability of this information, large numbers of individuals take up smoking, and the majority of current smokers continue to smoke. A theme that emerges in this section is the importance of considering smoking to be a pediatric disease (see Kessler, 1995). For most smokers, their habit is initiated while they are teenagers. The authors in this section consider why individuals continue to make the unhealthy decision to start smoking and to continue smoking, and how the tactics used by the tobacco industry may contribute to these decisions. By examining the evidence addressing why people start and stop smoking, policy makers may be better prepared to craft policy that specifically targets the weak links in the tobacco use cycle.

In the first article, Stephen Heishman, Lynn Kozlowski, and Jack Henningfield present evidence speaking to the addictive nature of nicotine. These authors note that there is little doubt that nicotine plays a crucial role in the development of addiction to tobacco products, and that this addiction typically develops in adolescence. They conclude by reviewing the current FDA initiative to reduce youth access to tobacco, and consider additional measures that may be beneficial in limiting the likelihood that adolescents will begin tobacco use and continue to use tobacco products.

In the second article, Donald Hine, Kate Tilleczek, Craig Summers, and John Lewko present a decision-making model that describes how adolescents make smoking decisions. Before adolescent addiction occurs, the adolescent must make the first decision to smoke. These authors examine that decision-making process, and consider how we may prevent the addiction process from beginning.

In the third and final article of this section, Richard Pollay reviews research addressing the marketing strategies used by the tobacco industry to sell its products. Pollay reviews a wide variety of evidence that converges on the conclusion

that adolescents are eminently aware of the advertisements presented by the tobacco industry, and that this awareness does make a difference in the willingness of adolescents to take up smoking. Given that the sale of tobacco to minors is illegal, Pollay argues that the government has a legitimate interest in regulating tobacco advertising.

Controversy and Opposition

As I have noted earlier in this article, the tobacco industry has provided significant opposition to any and all attempts to regulate tobacco products. One function of this opposition may be to create controversy, thereby shifting the focus of the debate from how to deal with tobacco to whether we should deal with tobacco at all. This section addresses some of the controversial issues raised by such opposition, and proposes some potential strategies for reducing the ensuing controversies.

In the first article in this section, Peter Jacobson, Jeffrey Wasserman, and John Anderson present a historical overview of tobacco legislation and regulation. These authors note that the regulation of tobacco products is not without precedent in this country. In the late 19th century, a number of states banned smoking on both moral and safety-related grounds (smoking in public created a significant fire danger when most structures were made of wood). These restrictions were eventually repealed as smoking became more popular in the early- and mid-20th century. Interest in legislation restricting smoking gained momentum again in the 1960s and beyond as the health risks of smoking and ETS became more clearly identified in the medical literature. Jacobson et al. conclude by cautioning that the significant gains made over the past 30 years are nevertheless fragile, and that, when dealing with the tobacco industry and its economic interest in smoking, we must remain vigilant in our protection of the legislative gains we have made.

In the second article in this section, I review social psychological research on smoker-nonsmoker interaction and note that smokers have become a stigmatized outgroup in our society. A wide variety of research suggests that nonsmokers respond to smokers in much the same way that members of ethnic majorities have historically responded to members of ethnic minorities. The demonization of smokers may be an unintended byproduct of increasing health concerns on the part of nonsmokers and the potential threat smokers pose to these health concerns. I conclude by suggesting that the legislated separation of smokers and nonsmokers may benefit both groups. Nonsmokers gain a healthier environment, while smokers may interact more frequently with nonsmokers while not smoking, thus potentially distancing themselves from their stigmatizing behavior and perhaps coming to be seen as less of a threat to nonsmokers.

In the third and final article of this section, David Altman, Douglas Levine, George Howard, and Hal Hamilton present the results of a recent study of attitudes of and about tobacco growers. One of the main weapons used by the tobacco

industry has been to produce sympathy for the hard-working tobacco farmer, and argue that any policies that could potentially reduce the prevalence of tobacco use will, by their very nature, harm this constituency. Altman et al. suggest that in order to more successfully reduce tobacco use, it may be crucial to provide alternatives for the tobacco farmer, and they present evidence that there is some general support for this position.

Interventions to Control Tobacco Use

In the final section are three articles addressing various strategies that have been used in attempts to reduce tobacco use. Despite the long-term decline in smoking prevalence in this country, some recent research suggests that adolescent smoking may again be on the rise (Johnston, O'Malley, & Bachman, 1995). Given these data it is important to consider what kinds of large-scale programs may be successful in continuing to reduce the prevalence of tobacco use in our society.

In the first article, Kenneth Ward, Robert Klesges, and Michael Halpern review evidence on smokers' readiness to quit as an important variable in the success of smoking cessation. A number of variables related to readiness are identified, and the importance of considering such variables when developing smoking cessation programs is emphasized.

In the second article of this section, Michael Siegel and Lois Biener present data from recent statewide programs initiated in California and Massachusetts. These states have created extensive anti-smoking campaigns, funded through increases in tobacco taxes. Siegel and Biener review research that identifies where these programs have had an impact and where they have not. They conclude with suggestions for future statewide programs created through similar tobacco tax revenues.

In the third article of this section, Graham Kelder and Richard Daynard examine the various litigation strategies that have been used against the tobacco industry. Kelder and Daynard discuss progress in what has been termed the "third wave" of tobacco product liability litigation. In the first and second wave of legal action against the tobacco industry, individual smokers (or their spouses) attempted to gain compensation from tobacco companies for the injurious consequences of the continued use of their products. These strategies failed because of the willingness of juries to hold smokers responsible for making the decision to smoke. Recent evidence regarding the tobacco industry's knowledge of the addictiveness of nicotine and their repeated attempts to withhold this knowledge has generated a third wave of litigation that has already proved more successful than the first two waves. Kelder and Daynard argue that such litigation may impact significantly on the cost of tobacco products, and therefore on the ease of initiating smoking, particularly for teens.

In the final article, I summarize the policy implications of the ideas presented by the authors in this issue. After reviewing the ideas presented in this issue, a number of themes emerge. Perhaps most striking is the important role of the adolescent market in the perpetuation of tobacco's power in our society.

Conclusion

The articles in this issue represent a multidisciplinary sampling of some of the approaches we might take to answering the question of how to deal with tobacco in our society. Tobacco use presents us with an extraordinary array of costs. It is my hope that the information presented in this issue might stimulate us to greater vigilance in our attempt to reduce these costs, and greater creativity in finding workable solutions to the problems created by tobacco.

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Nicotine Addiction: Implications for Public Health Policy

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Although the morbidity and mortality caused by cigarette smoking occur in adulthood, the initiation of tobacco use and the development of nicotine addiction typically occur during adolescence. The purpose of this paper is to examine the determinants of nicotine addiction, focusing on the development of addiction in youth, and to explore implications for public health policy. An understanding of the pharmacological and nonpharmacological factors that determine the course of nicotine addiction is critical in developing rational policies regarding tobacco products. The Food and Drug Administration's rule to regulate cigarettes and smokeless tobacco products is discussed. The fact that smokers typically make the transition from casual use to nicotine addiction during adolescence argues for developing and implementing effective prevention efforts and smoking cessation treatment programs that are youth-oriented.

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Each year in the United States, smoking kills more people than AIDS, vehicular accidents, homicides, suicides, fires, alcohol, and illicit drugs combined. More than 400,000 smokers die each year from smoking-related illnesses, and another 50,000 nonsmokers die from exposure to environmental tobacco smoke (Centers for Disease Control and Prevention [CDC], 1994). Worldwide, annual mortality rates are expected to increase from 3 million to 10 million over the next forty years, with 0.5 billion of the world's current population dying prematurely from tobacco-related disease (Peto et al., 1994).

About 70 percent of the 46 million current smokers in the United States would like to quit smoking, but less than 3 percent each year are able to remain tobacco-abstinent for one year (CDC, 1994; Fiore, 1992). The primary obstacle to quitting smoking is that the vast majority of tobacco users are addicted to nicotine (U.S. Department of Health and Human Services [USDHHS], 1988). Although the morbidity and mortality caused by smoking occur in adulthood, it is now clear that lifelong nicotine addiction typically begins with tobacco use in adolescence. For this reason, it is especially disconcerting that cigarette smoking is increasing among youth in the United States. From 1991 to 1994, the prevalence of past-month smoking among eighth graders increased from 14.3 percent to 18.6 percent, among tenth graders from 20.8 percent to 25.4 percent, and among twelfth graders from 27.8 percent to 31.2 percent (Johnston, O'Malley, & Bachman, 1995).

The purpose of this paper is to examine the determinants of nicotine addiction, with a focus on the development of addiction during adolescence. Clearly, pharmacological and nonpharmacological factors are involved in determining the course of nicotine addiction. An understanding of these factors and the ways in which they interact is critical in developing rational public health policies regarding the manufacture, distribution, and use of tobacco products. The last section of this paper explores such policy implications.

Nicotine Addiction

Terminology

Consistent with the writings of the U.S. Surgeon General, World Health Organization, American Psychological Association, and American Psychiatric Association, we consider the terms "drug addiction" and "drug dependence" to be synonymous and defined as a pattern of behavior focused on the repetitive and compulsive seeking and taking of a psychoactive drug (Heishman & Henningfield, 1992). In this paper, we will use the term drug addiction to avoid confusion with physical dependence. The development of physical dependence and the related process of tolerance may be components of drug addiction, but they are neither necessary nor sufficient conditions to maintain the behavioral pattern defined as drug addiction (cf. Jaffe, 1990; USDHHS, 1988). Tolerance and physical dependence

develop concurrently to most drugs, including nicotine; however, it is possible to demonstrate their independence.

Tolerance refers to a decreased responsiveness to the same dose of a drug as a function of repeated drug exposure. As a result of developing tolerance, individuals typically increase their drug intake over time. A toxicological consequence of tolerance to nicotine is that smokers inhale much higher levels of toxins and carcinogens than they would were they not tolerant and smoking only one or two cigarettes per day, rather than one or two packs per day. Physical dependence is defined by the emergence of a withdrawal syndrome upon abrupt cessation of drug use. With continued drug use, the body physiologically adapts to the presence of the drug, so that the drug is necessary for normal functioning. Within several hours without the drug, withdrawal signs and symptoms appear that are often opposite in nature to the effects produced by the drug. Depending on the person and duration and amount of drug intake, it may take from days to weeks for the person to feel normal in the absence of the drug. The acute withdrawal period for nicotine averages about 4 weeks.

Nicotine Is an Addictive Drug

The 1988 U.S. Surgeon General's report summarized a vast amount of research findings and reached three conclusions regarding the addictiveness of tobacco products: (1) Cigarettes and other forms of tobacco are addicting; (2) Nicotine is the drug in tobacco that causes addiction; and (3) The pharmacological and behavioral processes that determine tobacco addiction are similar to those that determine addiction to drugs such as heroin and cocaine (USDHHS, 1988). The report further concluded that tobacco use met three primary criteria for drug addiction: (1) Use is highly controlled or compulsive; (2) Nicotine in tobacco products produces psychoactive or mood-altering effects; and (3) Nicotine reinforces behavior that results in continued intake of nicotine in the form of tobacco products. All addictive drugs meet these three criteria. Additional criteria met by nicotine and shared with other drugs of abuse include stereotypic patterns of drug use, continued use despite harmful consequences, relapse following attempts to quit, recurrent drug cravings, drug-induced effects that are pleasant or of perceived benefit, and development of tolerance and physical dependence. Many of these aspects of nicotine addiction will be expanded in later sections.

Severity of Nicotine Addiction

Several studies have found nicotine to be as capable of producing addiction as heroin, cocaine, or alcohol (Henningfield, Clayton, & Pollin, 1990; Henningfield, Cohen, & Slade, 1991). Additionally, a higher percentage of cigarette smokers consider themselves to be dependent than users of other abused substances. For example,

in a 1990 poll, 61 percent of current smokers reported they considered themselves to be addicted to cigarettes (Gallup International Institute, 1992). These findings are consistent with those of the 1990 National Household Survey, which indicated that approximately 80 percent of people who smoked at least one pack per day felt they were dependent on tobacco. In contrast, among people who had consumed five or more alcoholic drinks in a row in the past thirty days, 17 percent reported they needed to drink or were dependent. The National Household Survey also indicated that among people who used cocaine eleven times or more in their lives, 8 percent reported they needed the drug or were dependent (Henningfield et al., 1990).

Unlike most other addictive drugs, occasional or low-level use of nicotine is relatively rare. For example, less than 15 percent of current alcohol drinkers are considered problem drinkers and 16 percent of people who report cocaine use during the past year have used cocaine in the past week, whereas about 90 percent of cigarette smokers smoke at least five cigarettes every day (Henningfield, 1992; Henningfield et al., 1991). Part of the reason that only 3 percent of smokers each year achieve abstinence for one year may be that most people who smoke daily report that they feel dependent and have experienced withdrawal symptoms (Henningfield et al., 1990; USDHHS, 1988).

Development of Addiction

The initiation of tobacco use and the development of nicotine addiction typically occur during adolescence (USDHHS, 1994); thus nicotine addiction has been termed a pediatric disease (Kessler, 1995; Slade, 1991). In the United States, the modal age for starting tobacco use is between eleven and fifteen; beginning after high school is rare (Johnston et al., 1995). A Gallup survey of cigarette smoking and markers of addiction indicated that 40 percent of teenage cigarette smokers begin smoking within one hour of awakening each day (a sign of addiction); 50 percent of teenage smokers had tried to quit but relapsed; 70 percent would not start smoking if they could "do it again"; and 38 percent of teenage smokers would be interested in smoking cessation programs targeted to their needs (Gallup International Institute, 1992). Data from the National Household Survey showed that twelve- to seventeen-year-olds develop tolerance, dependence, needs, increasing usage, and an inability to abstain from nicotine, indicating the addiction process is fundamentally the same as that seen in adults (Henningfield et al., 1990; USDHHS, 1988).

The likelihood of escalating from casual use to regular or compulsive use is much higher for cigarettes than for other addictive drugs. Recent surveys in the United States and United Kingdom suggest that 32-50 percent of those who try cigarettes become regular smokers, whereas a smaller percentage of people who have tried any form of cocaine, heroin, or alcohol graduate to addictive patterns of use (Anthony, Warner, & Kessler, 1994; Henningfield et al., 1991; McNeill, 1991). Consistent with these observations, the 1991 U.S. National Health Survey deter-

mined that approximately 70 percent of adolescents tried smoking, whereas only 25 percent smoked each of the thirty days preceding the survey. In the United States, where there is widespread awareness of smoking hazards, the probability of developing nicotine addiction after trying tobacco is about one in three (Anthony et al., 1994).

One factor fueling the increased prevalence of tobacco use and nicotine addiction among adolescents is the unprecedented growth of the smokeless tobacco (SLT) industry. In the 1970s, most SLT users were men aged fifty and older; less than 1 percent of all youth used SLT products. By the late 1980s, the demographics had reversed. During this period, the prevalence of SLT use among eighteen- to nineteen-year-old males increased by 1500 percent, and the lowest prevalence of use was in men over fifty. Rather than reducing the prevalence of cigarette smoking, the dramatic increase in SLT use provided a gateway to smoking, which may have contributed to increasing rates of smoking among youth in the 1990s (Connolly et al., 1986; Lynch & Bonnie, 1994). The reasons for the genesis of the SLT epidemic among adolescents are complex; however, several factors played a role, including characteristics of SLT products, marketing approaches, and the lack of educational and regulatory strategies.

In the 1970s, SLT products contained high levels of nicotine and were too noxious for experimentation by young persons. Thus, starter products, such as Skoal Bandits, containing low doses of nicotine (0.5-3 mg.) and flavoring to mask the tobacco were developed to capture the youth market (Food and Drug Administration [FDA], 1995). At least one SLT company targeted youth with its "graduation" marketing approach, in which starter products were heavily advertised to young audiences and were given as free samples at sporting events and concerts (Connolly, 1995; Freedman, 1994). As a result, many first-time SLT users began with these starter products and within several years had switched to higher dosage products, including cigarettes; there was little evidence of switching in the reverse direction (Tomar, Giovino, & Eriksen, 1995). Before the mid-1980s, relatively little attention was given to SLT products in anti-tobacco campaigns, resulting in more than 50 percent of youth rating SLT products as "safe" (USDHHS, 1986). SLT products provided little or no labeling concerning risks of use, no labeling concerning nicotine dose, and were as available as candy bars in convenience stores. Today, little has changed, with the exception of somewhat more labeling concerning risks of use.

Determinants of Nicotine Addiction

Pharmacological Determinants

Pharmacology of nicotine. Nicotine is a naturally occurring alkaloid found in the tobacco plant, *Nicotiana tabacum*, which has been cultivated for centuries for the manufacture of smoked and SLT products. Because nicotine is a small molecule

that is both lipid and water soluble, it is rapidly absorbed through the skin or lining of the mouth and nose. Rate of absorption is enhanced in a mildly alkaline environment and severely reduced in an acidic environment. Because of the massive area for gaseous exchange in the alveoli of the lungs, nicotine delivered via cigarette smoke is almost immediately extracted from the smoke and sent from the alveoli into the pulmonary veins, then pumped through the left ventricle of the heart into the arterial circulation, where it reaches organs, such as the brain, in less than ten seconds. The initial arterial bolus of nicotine may be ten times or more concentrated than levels measured in venous blood (Henningfield et al., 1993). SLT products do not produce this large arterial bolus of nicotine; however, SLT users who repeatedly put fresh tobacco into their mouth during the day can achieve stable levels of nicotine higher than those typically observed in cigarette smokers.

Nicotine delivery system. The tobacco cigarette is the most toxic and addictive form of nicotine delivery that has ever been widely used. The small doses and short-lived effects of nicotine delivered per puff require the smoker to inhale tobacco smoke regularly and frequently (about 200 times each day in a typical pack-per-day smoker) to maintain his or her addiction. Nicotine is distilled at the tip of the burning cigarette, where it is carried by particulate matter (tar droplets) deep into the lungs with inspired air. The nearly 2000°F microblast at the cigarette's tip is also the source of carbon monoxide and other toxins produced by the burning cigarette. In general, the type of cigarette and the nicotine delivery rating reported by tobacco manufacturers bear almost no relation to the amount of nicotine obtained per cigarette by the typical smoker (USDHHS, 1988). Most cigarettes in the U.S. market contain 6–9 mg. of nicotine, of which the smoker usually obtains 1–4 mg. (Benowitz, 1990; Benowitz et al., 1991). The typical pack-per-day smoker ingests 20–40 mg. of nicotine each day (Benowitz et al., 1991).

Changes in brain structure and function. Animal and human studies have shown that chronic nicotine administration produces changes in the physical structure of the brain and other parts of the nervous system by stimulating the expression of excess nicotine receptors on neurons. This process is termed *receptor up-regulation*. Postmortem studies of smokers have revealed nicotine receptor up-regulation and other changes in brain tissues as a result of cigarette smoking (Balfour, 1989, 1991; Bock & Marsh, 1990). Such morphological changes in the nervous system are being investigated for their possible contribution to the development of nicotine tolerance and physical dependence (Marks, Stitzel, & Collins, 1987; USDHHS, 1988).

Nicotine also produces a wide range of changes in the function of the central nervous system, including changes in brain metabolism and energy utilization, spontaneous EEG recordings, and evoked electrocortical potentials (USDHHS, 1988). Functioning of the endocrine system is also altered by nicotine in ways that

appear related to the addiction process (Pomerleau & Pomerleau, 1984; USDHHS, 1988). These diverse physiological effects of nicotine contribute to the addiction process by providing a variety of mechanisms by which behavior is reinforced by tobacco use. Such mechanisms include control of mood, appetite, and attention, and avoidance of withdrawal symptoms that occur because of physiological changes produced by chronic nicotine exposure.

Tolerance. Nicotine tolerance appears to be substantially acquired during adolescence as smokers progress from a few to many cigarettes (Henningfield, Schuh, & Jarvik, 1995). With chronic nicotine use, many of the physiological and behavioral responses to acute doses are reduced. Thus, the same dose of nicotine routinely inhaled by a smoker would have a much greater effect on a nonsmoker; for example, many first-time smokers become ill and intoxicated for several hours. Upon rapidly smoking a cigarette, even the experienced smoker who has been deprived of cigarettes for several days may experience signs of acute toxicity, such as nausea and dizziness, indicating that some of the tolerance to nicotine has been lost. It is rare for such smokers to experience the degree of sickness observed in first-time smokers. This reflects the experienced smokers' acquisition of tolerance and their ability to regulate their nicotine intake.

Cigarette smokers lose some degree of tolerance overnight, such that the first cigarettes of the day are reported as the strongest and/or the best cigarettes. Over the course of each day, tolerance increases, and the effects diminish. The first few cigarettes of the day may produce a substantial increase in heart rate lasting only a few minutes beyond the duration of the cigarette; thereafter, heart rate follows the same diurnal rhythm of nonsmokers over the course of the day, and is increased about seven beats per minute compared to the heart rate of nonsmokers (USDHHS, 1988). These observations indicate that only partial tolerance develops to many of nicotine's effects.

Physical dependence. The cellular and neurological adaptations that produce tolerance also lead to physical dependence. After at least several weeks of nicotine exposure, physical dependence develops, which is defined by the nicotine withdrawal syndrome that emerges following abstinence (American Psychiatric Association, 1994). The time course of withdrawal varies with individuals and responses, but, typically, onset begins within a few hours of the last cigarette, symptoms peak within a few days, and subside over the next several weeks. Specific withdrawal symptoms vary across individuals, but are generally unpleasant and frequently intolerable (USDHHS, 1988), and most smokers relapse before the syndrome begins to subside (Henningfield & Keenan, 1993; Hughes & Hatsukami, 1992). Frequently reported symptoms include increased craving, anxiety, irritability, appetite, decreased cognitive abilities and heart rate, and increased tendency to smoke (Hughes & Hatsukami, 1992; Pickworth, Herning, & Henningfield, 1989).

Nicotine replacement does not appear to shorten the course of the withdrawal syndrome, but can reduce symptom severity to tolerable levels.

A clinically important, but poorly understood, feature of nicotine addiction is craving. Cravings and urges to smoke cigarettes and use SLT have been described as obstacles confronting tobacco users attempting to quit, and have been identified as one of the most prominent symptoms of nicotine withdrawal (Hatsukami, Nelson, & Jensen, 1991; West, Hajek, & Belcher, 1989). At least two theoretical views of craving have been articulated. A multi-factor model of craving for cigarettes has identified positively-motivated (pleasure seeking) and negatively-motivated (avoiding withdrawal) urges to use tobacco (Maude-Griffin & Tiffany, 1996; Tiffany & Drobes, 1990). Another approach views the urge or desire to smoke as a single factor along an intensity dimension (Kozlowski et al., in press) with expectancies of what will happen from smoking (e.g., withdrawal relief or better concentration) as distinct issues (Brandon, Wetter, & Baker, 1996; Kozlowski & Wilkinson, 1987; Kozlowski et al., in press). Although craving and urge are widely discussed aspects of drug addiction in general, there is little evidence that suppressing cravings with medications enhances quitting success (Pickens & Johanson, 1992).

Nicotine reinforcement. Skinner (1938) defined a reinforcing stimulus as any consequence of an operant response that increases the probability of the response occurring again. In the 1960s, it was discovered that animals implanted with intravenous catheters would repeatedly press a lever to obtain an injection of a drug (Clark, Schuster, & Brady, 1961; Thompson & Schuster, 1964). In a Skinnerian interpretation, the drug was the stimulus that reinforced the operant response leading to its delivery. Numerous studies across many animal species have shown that intravenous nicotine is reliably self-administered (USDHHS, 1988). In humans, cigarette smoking is a complex behavior that becomes powerfully conditioned by several types of biobehavioral mechanisms. Such conditioning processes are maximally effective when the drug effect is discrete, paired with readily identifiable stimuli, and follows a specific behavior within a few seconds (Thompson & Schuster, 1964). The paradigm is optimal for smoking to become conditioned as each cigarette provides approximately ten discrete nicotine reinforcers (puffs), each delivered to the brain in about ten seconds. We briefly review the direct and indirect mechanisms by which nicotine reinforcement and conditioning come to control the behavior of the smoker.

Nicotine directly reinforces the behavior of tobacco smoking by the stimulation of nicotinic receptors in the brain. Because such reinforcements occur hundreds of times per day, the behaviors of seeking, lighting, and smoking cigarettes become conditioned through positive and negative reinforcement mechanisms (USDHHS, 1988). The activation of dopaminergic reward pathways in the brain appear to mediate the ability of nicotine to produce pleasurable effects and positive

reinforcement. Additionally, smoking provides relief of adverse symptoms of nicotine withdrawal (negative reinforcement).

Through classical and operant conditioning, sensory stimuli associated with smoking become immediately and powerfully reinforcing to the smoker. These include the sight, feel, and taste of cigarettes and the effects of various smoke constituents including nicotine in the mouth, nose, and throat (Kozlowski, 1982; Rose, 1988; USDHHS, 1988). All forms of tobacco involve stimulation of the chemical senses, which contribute to the physiological effects of tobacco and can help the smoker predict the effects of ingested smoke (Kozlowski, 1982). Environmental factors function as conditioned stimuli signaling the occasion for smoking, such as friends who smoke, the ringing of the telephone, tobacco advertisements, or a cup of coffee. In some people, such conditioned stimuli do more than set the occasion; they elicit powerful urges to smoke. The cigarette smoker has also learned to live under the influence of a drug that has become functional in the modulation of mood, appetite, energy, metabolism, and the ability to deal with stress and boredom (Pomerleau & Pomerleau, 1984; USDHHS, 1988). The myriad primary and secondary reinforcing effects of nicotine trap the smoker in a controlled behavioral pattern that is extremely difficult to change.

Beneficial effects of nicotine. In addition to the effects of nicotine to reinforce behavior and alleviate withdrawal symptoms, cigarette smokers commonly report benefits that may be at least partially attributable to nicotine. For example, some people claim smoking enhances their ability to handle stress, helps to control appetite and weight, increases the pleasure of leisure activities such as reading and listening to music, or facilitates social interactions. It has even been suggested that nicotine is not addictive and that the reason people smoke is for nicotine's cognitive enhancing effects (Warburton, 1992). However, reliable cognitive benefits of nicotine have been documented only in smokers who are experiencing cognitive deficits because of nicotine withdrawal (Heishman, Taylor, & Henningfield, 1994). In nonsmokers and nonabstinent smokers, nicotine has been shown to enhance finger-tapping rate and motor responses in tests of attention; cognitive functioning was not reliably enhanced (Heishman, Snyder, & Henningfield, 1993; Heishman et al., 1994). It is unlikely that these limited performance-enhancing effects of nicotine play an important role in the acquisition of cigarette smoking and the development of nicotine addiction. Even if some cognitive enhancement is part of nicotine's effects, it may be more sensible to view such effects as one component of the reinforcing effects of nicotine than to argue that such cognitive effects are a nonaddictive reason for smoking.

Nonpharmacological Determinants

Marketing. Although cigarettes are the source of more morbidity and mortality than any product invented, they are the object of the largest marketing effort in the United States. Each year, the tobacco industry spends nearly $4 billion advertising and promoting cigarettes (Warner et al., 1992). Such marketing influences cigarette consumption (USDHHS, 1989) through several potential mechanisms, including the use of advertising in luring adolescents to begin using tobacco, decreasing the resolve of smokers to stop smoking or consider quitting, encouraging relapse among those who have quit, and serving as a stimulus cue to smoke (Warner et al., 1992). A second marketing approach entails efforts directed at groups of people intended to promote a social or political environment supportive of tobacco use (Pollay, this issue). The tobacco industry has forged strong links for many years between itself and several ethnic and gender communities, including African Americans, Latinos, and women (Robinson et al., 1992). Arts groups have also received money from the cigarette industry. These groups have been loyal to the tobacco industry, in part, because they have been poorly supported by other sources of funding in society. However, such relationships are of public health concern because these populations remain at high risk for tobacco use and suffer disproportionately from smoking-related disease and death.

Accessibility. Because tobacco is a legal drug, accessibility is not an issue for adults. However, tobacco use by young people is of great concern, and accessibility is a primary factor in the initiation and maintenance of tobacco use among teenagers. The majority of states and the District of Columbia have laws regulating tobacco sales to minors, but these laws are rarely enforced. In several field studies, minors were able to purchase tobacco products from stores and vending machines 60-100 percent of the time (Altman et al., 1992). In the United States, annual illegal sales of tobacco to minors are estimated to be nearly 950 million packs of cigarettes and 26 million containers of SLT. These sales total $1.45 billion and generate more than $221 million in profits, which amount to 3 percent of the total industry.

Cost. It is well known that when tobacco products become more affordable, consumption increases; this is especially true for adolescents (Lynch & Bonnie, 1994). It is also widely recognized that tobacco taxes can be a potent way to decrease tobacco use. However, since 1950, there have been only two increases in the federal tobacco tax in the United States (Sweanor et al., 1992). Additionally, tobacco taxes have decreased, when adjusted for inflation, over the past thirty years. In 1964, the proportion of the retail price for a pack of cigarettes accounted for by taxes was 50 percent; today, it is 25 percent. The United States has the lowest tobacco taxes of any major industrialized country, and has not used taxes to reduce

tobacco use to a great extent. In contrast, tobacco taxation has been linked to health goals in the United Kingdom, Canada, New Zealand, and Hong Kong.

Public Health Policy Implications

Prevention

Education and prevention programs were very effective in the 1970s, when smoking prevalence among youth and the general population declined considerably (USDHHS, 1994). These tobacco control efforts contributed to the first documented decrease in tobacco-related morbidity in the United States in 1990 (CDC, 1993). However, current prevention and cessation programs vary greatly in their effectiveness with youth of the 1990s. Smoking prevention programs in the schools vary widely and are not particularly effective (Kozlowski et al., 1989; Lynch & Bonnie, 1994; USDHHS, 1994). Additionally, comprehensive community smoking-prevention programs are difficult to develop, expensive, relatively rare, and also are likely to have modest effects (Aguirre-Molina & Gorman, 1996). Public health prevention programs may have to adopt strategies used by consumer products manufacturers if prevention efforts are to be successful in reaching today's youth (Henningfield, 1994). Smoking often occurs in conjunction with other drug use, especially alcohol (Kozlowski et al., 1993), suggesting that optimal prevention and treatment strategies should also emphasize other drug use problems. Two public health policy approaches to prevention and treatment are selective regulation of tobacco products and the goal of harm reduction, rather than abstinence, in treating addicted smokers.

Regulatory Issues

Currently in the United States, tobacco products are not regulated in a way that is consistent with their adverse health effects and their addictiveness. The present system of regulation of products that deliver nicotine makes it easier to obtain tobacco products that cause disease and addiction than to get potentially lifesaving nicotine medications. Cigarettes and SLT products are readily available over the counter and from vending machines. In contrast, nicotine medications such as gum and the transdermal patch, which are far less toxic and addictive than cigarettes and SLT, until recently were available only with a prescription. Nicotine gum and the patch are now available over the counter, but are relatively expensive, approved for only a few months' use, and regulated by the FDA. Two regulatory issues will be discussed: the current lack of meaningful information concerning nicotine and tar yields of cigarettes, and the recent FDA rule regulating the access and appeal of cigarettes and SLT products to children and adolescents.

Labeling. A variety of terms are commonly misused in discussions of nicotine ratings. Most fundamentally, nicotine content is confused with nicotine yield. Nicotine content is the total amount of nicotine present in a tobacco cigarette. Nicotine yields are derived from smoking machine tests that were originally developed to provide standardized comparisons of the characteristics of tobacco smoke from different strains of tobacco (Kozlowski, 1983). Neither content nor yield ratings accurately predict how much nicotine the individual is likely to absorb from a cigarette (Benowitz et al., 1983; USDHHS, 1988).

The present testing method entails inserting cigarettes into the ports of automated systems, which then draw in smoke according to a set of parameters referred to as the Federal Trade Commission method (Pillsbury et al., 1969; U.S. Federal Trade Comission, 1991). However, data from numerous studies indicate that people naturally smoke more intensely than the smoking machines (USDHHS, 1988). Furthermore, when faced with a nominally low-yield cigarette or with limited availability of cigarettes, people smoke cigarettes more intensely (more frequent or deeper puffs) to consume an adequate level of nicotine (Benowitz et al., 1983; Benowitz, Jacob, Yu et al., 1986). Smokers may also block the ventilation holes in the cigarette filter with their lips or fingers, thereby defeating the "low-yield" mechanism of so-called Ultra-light and Light cigarettes (Kozlowski, Pillitteri, & Sweeney, 1994; Kozlowski, Pope, & Lux, 1988). Regardless of a cigarette's machine yield rating, smokers typically extract 1-4 mg. of nicotine from each cigarette (Benowitz et al., 1991), which is sufficient nicotine to produce and sustain addiction (Benowitz & Henningfield, 1994).

We have proposed a new system of rating and labeling cigarettes (Henningfield, Kozlowski, & Benowitz, 1994). The proposal involves categorizing cigarettes based on their nicotine delivery. These ratings would be included as part of a new label for cigarettes, which would include a warning statement; nicotine-yield category; nicotine, tar, and carbon monoxide yields; nicotine content; harmful additives; and information about factors affecting nicotine delivery, such as covering filter ventilation holes with fingers or lips, resulting in greater delivery of nicotine and other toxins. Kozlowski and Sweeney (in press) have argued that the term "Light" should be banned as misleading, and that filter-vents should be made visible and palpable to the fingers or lips. Machines used to provide estimates of nicotine yield and other cigarette characteristics should be programmed with puffing parameters that are representative of the behavior of cigarette smokers and should test cigarettes under average and heavy smoking conditions. This would provide information about the usual and maximal yields of a particular cigarette.

The enhanced labeling system should inform smokers that smoking cigarettes with reduced nicotine yield may facilitate their efforts to quit smoking but may provide little, if any, general health benefit compared with regular cigarettes. The important public health benefit would be to lessen the prevalence of tobacco smoking in several ways. Many consumers are already highly motivated to smoke cigarettes with

a lower nicotine yield for the presumed health benefit (Cohen, 1992); cigarettes now labeled "low-yield" (less than 16 mg. tar) account for approximately 60 percent of the market (Shapiro, 1994). If such misleading labeling is prohibited and replaced with an accurate reporting of nicotine yield, smokers may be more motivated to attempt to quit. In addition, if manufacturers were to market cigarettes with a broad range of nicotine yields, these products might facilitate the efforts of smokers to gradually wean themselves off nicotine. The major goal of improved labeling, however, would be to provide the basic information that can now be obtained with most other consumable products, including alcoholic beverages.

FDA regulation. In 1988, the Coalition on Smoking or Health petitioned FDA to regulate the manufacture, sale, distribution, labeling, advertising, and promotion of cigarettes and other tobacco products. It was not until 1992 that then-new FDA Commissioner David Kessler, M.D., ordered a systematic review of the merits of the petition. In February 1994, Dr. Kessler informed the Coalition on Smoking or Health that its petition had sufficient merit to warrant a full investigation. The investigation continued for more than a year, during which FDA testified before Congress, and an FDA Advisory Panel concluded that all presently available cigarettes in the United States provided addicting levels of nicotine. On August 11, 1995, FDA issued its proposed rule to regulate cigarettes and SLT products, having reached the following conclusions: (1) Nicotine delivered by cigarettes and SLT is a drug; (2) These products function as drug delivery devices; and (3) Tobacco companies intend for these products to cause addiction in users (FDA, 1995). The FDA also documented a convincing record of willful study by the tobacco industry of the addicting characteristics of tobacco products and how to apply such findings to product development and marketing strategies (see Kelder & Daynard, this issue). Following an eight-month period of public comment on the proposed rule, the final FDA rule was issued on August 23, 1996.

The purpose of FDA's tobacco regulation (FDA, 1996) is to reduce the death and disease caused by tobacco. To this end, the regulation is focused on reducing tobacco use and addiction among youth by 50 percent within seven years. If this goal is not reached, FDA will develop additional measures to achieve that reduction. The FDA's approach is two-fold: to decrease access to and reduce appeal of tobacco products among youth. Adult access to tobacco products or product information would be little changed under the regulation; FDA recognizes that tobacco prohibition is unworkable. The FDA regulation is not intended to prevent all tobacco use, but, rather, would increase barriers to developing and maintaining nicotine addiction among adolescents.

According to the FDA regulation, reducing access to tobacco products among youth would include the following: (1) requiring face-to-face sales by adults; (2) establishing and enforcing a nationwide minimum age of eighteen years for the purchase of cigarettes; (3) banning cigarette sales in vending machines, except in facili-

ties inaccessible to persons under eighteen (underage youth use vending machines to purchase cigarettes 82-100 percent of the time [USDHHS, 1994]); and (4) prohibiting free samples and self-service displays. Reducing appeal of tobacco products would include the following: (1) banning billboard advertising near schools and playgrounds; (2) restricting advertising in youth-oriented magazines to text-only format; (3) banning the sale of promotional nontobacco items such as hats, tee-shirts, and toys that display tobacco brand information; and (4) restricting sponsorship of sporting events and concerts to the corporate name only (FDA, 1996). Through the Federal Food, Drug, and Cosmetic Act, FDA will also propose that tobacco manufacturers conduct a national public campaign to educate children and adolescents about the health risks of tobacco products.

A precipitous decline in the size of the tobacco market in the United States, although clearly in the public health interest, would be unlikely under FDA's tobacco regulation. Nevertheless, the tobacco industry is using its considerable economic and political influence to oppose FDA regulation by providing substantial campaign financing to politicians who are inclined to protect the industry from FDA, and by filing lawsuits against FDA's authority to regulate tobacco products (Arno et al., 1996). Specific challenges to FDA's authority included detailed legal arguments questioning whether FDA had followed proper procedure in developing and issuing its regulation, challenging the basis for the claims that nicotine medications work, and the conclusion that nicotine in tobacco products serves any purpose other than as a natural constituent of tobacco, providing a pleasant sensory experience for the tobacco user (FDA, 1996).

The final rule has already been challenged by the tobacco industry. The stakes are high; millions of today's smokers will die prematurely with great suffering due to tobacco-caused disease over the next few decades unless they find ways to quit smoking. Millions more children who have not yet begun to smoke are likely to be recruited by the tobacco industry, and one-third or more may die prematurely of tobacco-caused disease. The tobacco industry is one of the most lucrative industries in the world, and individual companies do not appear willing to give up any market share or significantly restrict their marketing efforts in the interest of public health.

Harm Reduction

Traditional smoking cessation treatment may not be the only strategy to achieve the long-term goal of reducing tobacco-related disease and death. Other strategies might include alternative tobacco products to reduce the intake of smoke-borne toxins and expanded treatment options for addicted tobacco users. Such alternatives to smoking abstinence have been termed "harm reduction." One potential strategy of harm reduction may be to encourage the use of tobacco products other than cigarettes, or to modify cigarettes so as to reduce their harmful effects. However, new types of cigarettes may not reduce harm from smoking, and it is known

that the use of SLT products entails health risks and should not be encouraged as a substitute for cessation of tobacco use. Therefore, we focus on treatment strategies as harm reduction alternatives.

Treatment approach. Effective cessation intervention approaches, such as nicotine replacement therapies, may be considered major medical treatment advances because they enable health professionals to double quit rates of these patients, compared with those given a placebo treatment. On the other hand, the majority of people treated with any form of smoking cessation therapy relapse to addictive cigarette smoking; their needs do not appear to be addressed adequately by current approaches, and treatment may be terminated if they resume smoking. One solution is to "recycle" such patients into new treatment programs (Hughes, 1994). Even outside of formal treatment, when smokers try to quit smoking over decades, the cumulative success rates are much higher (about 60 percent) than those for a single quit attempt (Schachter, 1982); yet 40 percent of the population still smoking would represent a huge public health risk.

A complimentary approach is to expand the range of treatment options and goals. The indications for evaluating medications for treating nicotine dependence that have been proposed to FDA (Woody et al., 1992) are an example of such an approach. The proposed indications are as follows: Relieve withdrawal, decrease use/achieve abstinence, prevent relapse, and reverse toxic effects. These proposed indications are similar to those for medications targeted at other psychoactive substance-use disorders, such as cocaine, opioid, and alcohol addiction. The first three indications appear to be viable goals for existing medications; however, important questions need to be resolved by further research.

For example, would helping people achieve intermittent tobacco abstinence to meet occupational demands by treating withdrawal symptoms increase or decrease the likelihood of quitting smoking? Similarly, the protracted use of replacement medications to produce what might be termed "partial tobacco abstinence" has not been studied as an end point in its own right, even though substantial smoking reduction has been reported as a by-product of cessation efforts (Transdermal Nicotine Study Group, 1991). Finally, the protracted use of medications to sustain remission and prevent relapse is widely practiced in other areas of medicine, but has not been studied carefully as a potential approach to treating nicotine addiction.

In contrast to the use of tobacco products in harm reduction approaches, expanded use of nicotine-delivering medications might be effective at reducing harm in individual tobacco users as well as in the population. Nicotine replacement medications studied to date, such as gum and transdermal patches, do not contain the highly toxic substances seen in tobacco products, do not provide the explosive bursts of highly concentrated nicotine doses to the arterial blood stream, and appear to be substantially less capable of causing new addiction problems or sustaining addiction compared to tobacco products (Henningfield & Keenan, 1993; Henning-

field et al., 1993; USDHHS, 1988). The risks and benefits of new harm reduction strategies to nicotine addiction should be analyzed carefully with respect to current treatment approaches, which have been successful for millions of formerly addicted smokers.

Conclusions

The vast majority of adult cigarette smokers began smoking as adolescents. The primary policy implication has been that prevention campaigns were aimed at youth, and smoking cessation treatment was offered only to adults. However, the fact that smokers typically make the transition from casual use to nicotine addiction during adolescence (Lynch & Bonnie, 1994; USDHHS, 1994) argues for a shift in tobacco control policy, namely that smoking cessation treatment should be available for youth. The increasing prevalence of adolescent tobacco use in the 1990s, the high risk of developing nicotine addiction relative to other addictive drugs, and the fact that smoking is associated with other drug use, especially alcohol, strongly suggest that a broad range of effective prevention and treatment interventions must be developed for adolescents at all stages of tobacco use. Harm reduction strategies may be effective components of such interventions. The tobacco and health problem is far from solved in the United States. The FDA regulations may contribute to a resumption of the decline in tobacco use seen during the 1980s. Prevention, cessation, and harm reduction strategies are each important elements in reducing the public health disaster caused by cigarette smoking. All of these efforts, supported by a strong foundation of basic research, will be critical in reversing the progression of tobacco-caused morbidity and mortality at the societal and individual level.

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Expectancies and Mental Models as Determinants of Adolescents' Smoking Decisions

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Cigarette smoking has been identified as the single most preventable source of mortality and morbidity in the United States. Experimentation with tobacco typically begins in adolescence, and smoking during this period is one of the strongest and most consistent predictors of adult smoking status. In the present paper, we review several prominent decision models that have been applied to adolescent smoking, and point out important limitations of these models. We then propose a new process-oriented framework of decision-making based on the concept of mental models, and discuss the implications of this framework for developing effective smoking prevention and cessation interventions for adolescents.

Smoking has been linked to a host of health problems including heart disease, cancer, chronic bronchitis and emphysema (Schwartz, 1987), and has been repeatedly identified as the single most preventable source of mortality and morbidity in the United States (Fielding, 1985; Russell, 1990). In Canada, smoking is responsible for approximately 40,000 deaths per year, more than four times the number attributed to alcohol, AIDS, car accidents, suicide, and murder combined (Schabas, 1996).

Initial experimentation with tobacco typically begins in early adolescence (Russell, 1990; Sussman et al., 1995), and even limited exposure to cigarettes during this period substantially raises the probability of regular smoking in adulthood. For example, Chassin et al. (1990) report that individuals who smoked at least once per month during their teenage years were more than sixteen times more likely to be regular smokers as adults. Similar findings have been reported elsewhere. Based on a re-analysis of a representative survey of 984 adults from the United Kingdom, Russell (1990) concluded that over 90 percent of respondents

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who had smoked four or more cigarettes during adolescence developed a long-term smoking habit that lasted into adulthood. An Irish study conducted by O'Connor and Daly (1985) produced comparable, although slightly less dramatic, results: 75 percent of all respondents who had experimented with cigarettes during adolescence became regular smokers.

The prevalence of smoking among adolescents is high and rising. A recent survey of Southern California youth found 60 percent of seventh-graders, 65 percent of eighth-graders, and 70 percent of ninth-graders had tried smoking (Sussman et al., 1995). In 1991, 28 percent of high-school seniors had smoked within the previous thirty days. By 1993 the proportion had increased to 30 percent (Kessler, 1995). A similar trend is evident in Canada. The smoking rate for Canadian youth increased from 21 percent in 1991 to 27 percent in 1994 (*Health Canada Survey on Smoking*, cited in Payne, 1995).

Given the prevalence of tobacco use among young people, and the health and social costs associated with this behavior, it is important to understand why increasing numbers of adolescents are choosing to smoke. In this paper, we address this important social issue from a decision-making perspective. We begin the paper with an overview of several prominent models of decision making, and discuss what they can and cannot tell us about adolescent smoking. In the second section, we propose a process-oriented model of decision making based on the concept of mental models, and explore the implications of this model for developing effective smoking prevention and cessation interventions.

Expectancy-Value Approaches to Adolescent Smoking Decisions

Decision making is the process of making choices among alternative courses of action. Most people make several important decisions about tobacco use during their lives. Nonsmokers face decisions about whether or not to smoke their first cigarette, regular smokers face decisions about quitting, and exsmokers face decisions about beginning again.

Over the years, numerous models of decision making have been proposed. Expected utility theory (EU), initially developed by von Neumann and Morgenstern (1947), represents one of the earliest of these models. According to the theory, the expected utility of a given choice is the sum of the subjective values attached to the possible consequences of the choice, each weighted by the probabilities that the choice will lead to those consequences. The theory can be displayed algebraically as follows:

$$E\,U = \sum V_i P_i$$

where V is the subjective value associated with a given outcome, and P is the probability that the outcome will occur. The theory predicts that when decision makers

are faced with several courses of action (e.g., smoking versus not smoking), they will choose the option that is most likely to bring them the most desirable outcomes or highest utility.

One important limitation of EU is that it assumes that the probabilities of outcomes are known exactly by the decisionmaker, an assumption that is violated in many real-world decision contexts. This limitation was addressed by Savage (1954), who extended EU to situations in which probabilities were uncertain. This new approach, known as subjective expected utility theory (SEU), relies on the same principle of expected-utility-maximization as EU. However, whereas in EU the probabilities of anticipated events are given, in SEU these probabilities are estimated by the decision maker. Thus, the formula for computing SEU is:

$$S E U = \sum V_i P_i$$

where (as in EU) V is the subjective value associated with a given event, and P is the subjective probability that the event will occur as estimated by the decision maker.

SEU is a very general decision model that can be adapted readily to decisions both to begin smoking (smoking initiation) and to quit smoking (smoking cessation). For example, when deciding whether or not to experiment with tobacco, an individual may (consciously or unconsciously) combine the subjective values and probabilities of several potential consequences associated with smoking (e.g., receiving peer approval, feeling mature, getting cancer, etc.) and not smoking (e.g., being ridiculed by peers, receiving parental approval, etc.). To the extent that the subjective expected utility for smoking outweighs the subjective expected utility for not smoking, the model predicts smoking behavior to occur. In terms of smoking cessation, the same basic logic applies: The smoker is faced with a choice between continuing to smoke and attempting to quit. If the subjective expected utility for quitting outweighs that for continuing, the model predicts that the smoker will attempt to quit.

Other Expectancy-Value Models

SEU has spawned a number of other decision models, which are collectively known as expectancy-value models of behavior (Stroebe & Stroebe, 1995; Sutton, 1987). Several of these SEU-derived models, such as the health-belief model (Becker, 1974), and protection-motivation theory (Rogers & Mewborn, 1976; Rogers, 1983), focus directly on health-related behaviors. Others, such as the theory of reasoned action (Fishbein & Ajzen, 1975) and the theory of planned behavior (Ajzen, 1988), are intended as more general models of behavior. A summary of the principal variables and combination rules used in each of these models is presented in Table 1.

As the expectancy-value label suggests, all of these models assume that anticipated outcomes, and in particular the values and probabilities placed on these out-

Table 1. Variables and Combination Rules for Expectancy-Value Models

	Variables and Combination Rule
Health-Belief Model	$LPA = V + P + (B - C)$
Protection-Motivation Theory	$PM = (V + L - B) + (RE + SE - C)$
Theory of Reasoned Action	$BI = A + SN$, where $A = \sum V_i P_i$
Theory of Planned Behavior	$BI = A + SN + CO$, where $A = \sum V_i P_i$

Note: For the health-belief model, LPA refers to the likelihood of preventative action, V refers to perceived severity of a specified negative health outcome (i.e., value in SEU terms), P is perceived personal vulnerability to the negative health outcome (i.e., probability in SEU terms), B is perceived benefit of taking preventative action, and C is perceived cost of taking preventative action. For protection-motivation theory, PM refers to protection motivation (the intention to engage in a preventative health behavior), V is perceived severity of a specified negative health outcome, L is perceived likelihood of the negative health outcome, B is perceived benefit associated with continuing the health-threatening behavior (smoking), RE is perceived effectiveness of preventative action (response efficacy), SE is the belief that preventative action can be effectively performed (self-efficacy), and C is perceived costs associated with engaging in the preventative action. For the theories of reasoned action and planned behavior, A is attitude toward the behavior defined in SEU terms, SN refers to the subjective norms associated with the behavior, and CO is perceived personal control over the behavior. For these last two theories, behavior is assumed to follow directly from behavioral intentions (BI).

comes, are important determinants of decision-making and/or behavior. Despite this basic similarity, expectancy-value models differ from one another in several respects (Weinstein, 1993). The most important of these differences include: (1) the extent to which nonexpectancy factors are incorporated into the models, (2) the specificity with which relevant outcomes are identified *a priori* by the model, and (3) the rules used in the models to combine variables to predict behavior.

Inclusion of nonexpectancy factors. Like SEU, the health-belief model assumes that behavior is completely determined by anticipated outcomes. No additional non-outcome-based variables are specified in either model. Contrary to this view, protection motivation theory, the theory of reasoned action, and the theory of planned behavior all assume that anticipated outcomes alone are not sufficient to fully account for behavior. All three models posit that the impact of anticipated outcomes on behavior is indirect, being mediated by behavioral intentions. According to the theory of reasoned action, behavioral intentions are determined by two main cognitive components: attitudes and subjective norms. Attitudes are defined in expectancy-value terms as a function of the perceived likelihood and value of personal outcomes stemming from a given behavior. Subjective norms are defined as the product of (1) peoples' personal beliefs about how important others want them to act, and (2) their motivation to comply with those expectations. Thus, according to

this model, expectancies about future outcomes are necessary but not sufficient to provide a complete account of adolescents' smoking intentions and behavior. The normative influence of significant others (e.g., peers, parents, teachers, etc.) also must be taken into account.

The theory of planned behavior (Ajzen, 1988) is an extension of the theory of reasoned action, and assumes that behavioral intentions are determined by a third cognitive factor in addition to attitudes and subjective norms. This third factor, perceived controllability of behavior, refers to the decision maker's perceptions of personal control over the successful completion of a behavior, a construct very similar to Bandura's (1986) notion of self-efficacy. According to the theory, low perceived control over a given behavior reduces the probability that intentions for that behavior will be formed. For example, in terms of smoking initiation, the theory predicts that adolescents who are more confident in their abilities to use tobacco successfully (e.g., lighting a cigarette without difficulty, not coughing, etc.) will be more likely to develop intentions to begin smoking. Similarly, smokers who believe that they lack the self-control needed to give up cigarettes should be less likely to formulate intentions to quit. The notion that perceived control (self-efficacy) plays an important role in determining health behavior intentions is also evident in protection-motivation theory (Rippetoe & Rogers, 1987; Rogers, 1983).

Specificity of outcomes. The health-belief model and protection-motivation theory both attempt to specify which anticipated outcomes are most relevant to predicting health behaviors. For example, the health-belief model is based on the assumption that people consider three main types of consequences when making health-protective decisions: the negative health consequences associated with current behavior; the perceived costs associated with taking preventative action; and the perceived benefits of taking preventative action. Protection-motivation theory assumes that the same three consequences are relevant, and adds a fourth: the perceived benefits of continuing the current health-threatening behavior.

Unlike these two health-behavior models, SEU makes no predictions about the specific types of consequences or outcomes that a person will consider when making a decision. Some people will base their decisions primarily on health outcomes, whereas others may focus more on the social and financial consequences of smoking. SEU simply provides a rule for combining value and expectancy weights for outcomes that have been identified as relevant by the decision maker. The same can be said for the theories of reasoned action and planned behavior, which define attitudes according to the general SEU model. This high degree of flexibility can be viewed as both a strength and a weakness of this approach. On the one hand, it implicitly recognizes the importance of individual and group differences in structuring decisions. On the other hand, it makes no attempt to specify what these differences might be.

Combination rules. As discussed earlier, SEU theory assumes that decision makers employ a multiplicative rule to compute the subjective expected utility associated with any given anticipated outcome, and an additive rule to combine these utilities across the set of anticipated outcomes associated with any given behavior. For the theories of reasoned action and planned behavior, attitudes are computed using the same combinatorial rules specified by SEU. In turn, attitudes are assumed to combine additively with subjective norms and perceived control to predict behavioral intentions. The health-belief model makes no assumptions about how the variables in the model should be combined to best predict behavior (Sutton, 1987; Weinstein, 1993). However, Seibold and Roper 1979 (cited in Stroebe & Stroebe, 1995) suggest that the simple additive model presented in Table 1 accurately reflects how most health-belief researchers discuss the model and analyze their data. The most recent revision of protection-motivation theory is also based on the assumption that the main variables in the model should be combined additively (Rippetoe & Rogers, 1987).

Empirical support for expectancy-value models. Numerous studies have applied the expectancy-value approach to tobacco use, and most have found expectancies (or attitudes defined in expectancy-value terms) to be important predictors of smoking intentions for both adults (e.g., Fishbein, 1982; Swinehart & Kirscht, 1966) and adolescents (e.g., Chassin et al., 1981; Chassin et al., 1984). Evidence linking expectancies to actual smoking behavior has been less consistent. Some studies report significant effects (e.g., Bauman & Chenoweth, 1984; Marshall, 1990; Mausner & Platt, 1971), whereas others do not (e.g., Godin et al., 1992). This pattern of results (i.e., expectancies consistently predicting smoking intentions but not smoking behavior) is probably at least partly attributable to the addictive properties of nicotine. Smokers who associate positive outcomes with quitting may develop strong intentions to quit, but their physiological addiction may make it difficult to sustain these intentions during withdrawal. Although, as we discuss later, other factors also likely contribute to the breakdown between intentions and behavior.

Several studies that have applied the theories of reasoned action and planned behavior to smoking have found subjective norms and/or perceived control over behavior (self-efficacy) to account for a significant amount of variance in smoking intentions over and above that accounted for by expectancies (e.g., Chassin et al., 1981; deVries, Kok, & Dijkstra, 1990; Fishbein, 1982). Comparisons of the relative importance of expectancies, subjective norms, and behavior control have produced mixed results. Some studies suggest that expectancies are the strongest predictor of smoking intentions (e.g., Babrow, Black, & Tiffany, 1990; Sutton, 1987), whereas others do not (Godin et al., 1992). Other nonexpectancy variables not specified by the theories of reasoned action or planned behavior (e.g., past experience with tobacco and previous quitting attempts) have also been linked to smoking intentions and behavior (Chassin et al., 1984; Sutton, 1987). This sug-

gests smoking decisions (intentions) may be only partly under the control of expectancies.

The significant relationship between overall expectancies and behavioral intentions and/or behavior reported in many smoking studies suggests that there is a degree of internal consistency between the consequences that people associate with smoking and the decisions that they make about smoking. However, it tells us little about which anticipated outcomes are most strongly related to smoking intentions and behavior. Several studies have addressed this issue. Brandon and Baker (1991) had 382 undergraduates provide value and likelihood ratings for eighty possible consequences of smoking. Principal components analysis produced four interpretable components, three of which discriminated between daily smokers and individuals who had never smoked. Daily smokers tended to provide higher value and probability ratings for items related to the positive reinforcing effects of smoking (e.g., pleasant taste, relaxation, enjoying life), the negative reinforcing effects (e.g., stress management, anger control), and appetite-weight control than nonsmokers. A similar study focusing on smoking cessation found that expectancies related to health, finances, social relations, and self-esteem discriminated between individuals who intended to quit smoking and those who did not (Sutton, Marsh, & Matheson, 1990).

A Mental Models Decision Framework for Adolescent Smoking

Although expectancy-value models of smoking have received considerable empirical support, as descriptive models of decision making they are limited in several respects. One limitation is that they tend to place too much emphasis on how expectancies are best weighted and combined to predict behavior, while telling us little about the actual cognitive processes involved in making a decision. A second related problem is that these models are not sufficiently grounded in cognitive theory. No attempt is made to provide an account of the basic information processing and memory processes that that underlie decision making. We believe that these basic processes represent an important key to understanding adolescents' smoking decisions, and provide a useful theoretical basis for developing effective smoking prevention and cessation interventions.

In this section of the article, we introduce the concept of mental models and propose a process-oriented decision framework based on this construct. We argue that our proposed framework extends the expectancy-value approach by addressing the two deficiencies outlined above. We also discuss the implications of this framework for developing effective smoking prevention and cessation interventions for adolescents.

Mental Models: An Overview

Various definitions of mental models have been offered. Jungermann, Schütz, and Thüring (1988, p. 148) defined mental models as "a mapping from a domain into a mental representation that contains the main characteristics of the domain." From a more functional perspective, Craik (1943) proposed that mental models are small-scale representations of external reality that enable organisms to

> try out various alternatives, conclude which is the best of them, react to future situations before they arise, utilize knowledge of past events in dealing with the present and the future, and in every way react in a much fuller, safer, and more competent manner to the emergencies that face it (p. 61).

A similar view has been offered by Johnson-Laird (1983, p. 379), who noted that "mental models enable individuals to make inferences and predictions, to understand phenomena, to decide what action to take and to control its execution, and above all to experience events by proxy." Finally, Rouse and Morris (1986, p. 351) described mental models as "the mechanisms whereby humans are able to generate descriptions of system purpose and form, explanations of system functioning and observed system states, and predictions of future system states." Thus, a primary function of mental models is to enable the decision maker to mentally simulate possible future outcomes (i.e., develop expectancies) for different courses of action, without actually physically engaging in those actions. Based on the outcomes of the mental simulations, choices can be made about what constitutes the most appropriate course of action.

A Mental Models Decision Framework

Integrating previous work by Jungermann and Thüring (1987) on scenario production and by Furby and Beyth-Marom (1992) on behavioral decision theory, we propose the following process-oriented decision framework. A summary of the framework is presented in Figure 1.

Knowledge activation. The first step in the model involves the activation of knowledge stored in memory that is relevant to the decision at hand. Knowledge in memory is often conceptualized as a collection of nodes, representing concepts, linked together in a complex associative network (Anderson, 1983). According to these network models of memory, knowledge activation is a neurophysiological process in which an external or internal stimulus activates a node or series of nodes in the network. This activation is assumed to spread through the network activating related nodes. The stronger the relationship between concepts, the stronger and faster the activation is assumed to spread (Anderson, 1983).

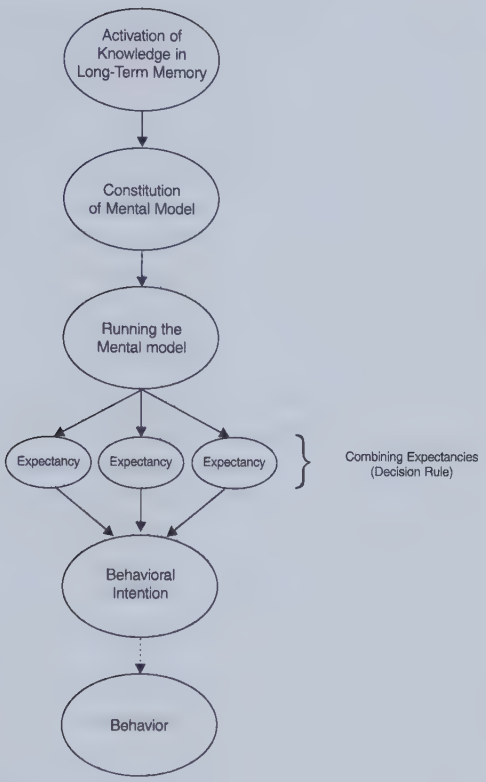

Fig. 1. A Mental models decision framework.

The knowledge activation step in the expectancy-generation process has several important implications for smoking decisions. First, in order to be activated, knowledge must first be present in memory. If an adolescent has no information related to lung cancer and heart disease, this information cannot be activated. Second, even if this information is present, there is no guarantee that it will be activated when a smoking decision is being made. Much depends on how health and smoking knowledge is organized in memory, and the strength of the associations between the nodes of these two knowledge domains. If the associations between nodes are strong, an appropriate stimulus should activate both types of knowledge. On the other hand, if the associations are weak or nonexistent, much of the decisionmaker's health knowledge will not be activated, and therefore have no impact on the decision.

Constitution of the mental model. The second step of the expectancy-generation process involves constituting a mental model from the knowledge activated in Step 1. As noted earlier, mental models describe the main concepts and rela-

tionships in a domain, and are used to generate inferences about possible future states within that domain. To construct a mental model, the decision maker must first retrieve elements and relations from the store of activated knowledge. In addition to simply retrieving relevant concepts and relations from memory, the model constitution process also may involve an element of constructive reasoning that enables the individual to move beyond the existing data. For example, even if a causal link between smoking and cancer is not present in memory, it is possible for this link to be created in the mental model through online processes such as those described by Kelley's (1967) covariation model of attribution.

It is presently not clear whether there are limits to the complexity of mental models. However, it seems reasonable that time constraints and motivational factors would restrict the number of concepts and relations included in a model for any given decision. This suggests that simply being active in memory is not sufficient to ensure a concept's inclusion in the mental model. A further winnowing process occurs in which only certain concepts and relations are selected. According to Jungermann and Thüring (1987), this winnowing process is accomplished primarily on the basis of salience. In general, knowledge that is novel, vivid, perceived to be relevant to the decision maker's goals, and that has been frequently activated in the past tends to be more salient and thus accessible (Fiske & Taylor, 1991). Tulving's (1983) encoding specificity principle suggests that compatibility between encoding-retrieval processes and contexts is also an important factor underlying accessibility.

Once again this has important implications for understanding adolescents' smoking decisions. Even if first-time smokers are knowledgeable about the negative health effects of smoking, and even if this knowledge is active in memory when they make their initial decision to smoke or not smoke, it still may not be included in their mental model if it is not sufficiently salient to displace other health-unrelated concepts (e.g., peer approval) that are also competing for inclusion.

Running the mental model. Once constituted, a mental model can be "run" to generate expectancies about possible outcomes. Jungermann and Thüring (1987) suggest that the running of a model involves several distinct steps, including: choosing a variable from which the simulation cycle can begin (i.e., the input variable); specifying the value of the input variable (e.g., starting to smoke versus not smoking, continuing to smoke versus trying to quit, etc.); searching for causally related variables (these searches can be either forward-directed to identify potential consequences of the input variable, or backward-directed to identify potential causes of the input variable); and specifying values for the simulated outcome variables on one or more dimensions (e.g., the probability and desirability of developing cancer later in life, of gaining peer approval now, etc.). Although decision theorists have identified probability, desirability, and time as the most relevant dimensions for evaluating possible outcomes, these dimensions, of course, are not used by all decision makers in all situations.

The number of simulations run for a given model will vary across contexts and individuals. If the decision is perceived to be important, there are few time constraints, and motivation is high, the decision maker may specify several different values for various input variables, repeatedly run the model, and systematically evaluate the resulting outcomes. However, given that adolescents' smoking decisions, especially those related to initial use, are often made in "high pressure" social situations in which there is little time to reflect upon one's choices, this type of systematic analysis is probably more the exception than the rule.

Combining expectancies using a decision rule. After running the model and simulating and evaluating one or more possible outcomes, the next task for the decision maker is to integrate the simulated information using a decision rule. Several examples of decision rules were outlined in the first half of this paper. For example, the combination rule for SEU involves multiplying probability and value ratings for each simulated outcome, and summing the products across all outcomes. On the other hand, the health-belief model is based on a rule in which probability and value assessments are summed rather than multiplied. Although decision researchers have relied almost exclusively on multiplicative and additive rules to predict behavioral intentions and behavior, as Furby and Beyth-Marom (1992) point out, other types of rules are, in fact, possible. For example, to minimize personal risk, they suggest a rule that would eliminate all actions that have a chance, no matter how small, of producing a large negative outcome. Given the absence of studies comparing the predictive utility of additive and multiplicative combination rules (Weinstein, 1993), and the possibility that decision rules often may be applied subconsciously (Furby & Beyth-Marom, 1992), it is presently not clear which rules might best account for adolescents' smoking decisions, and whether or not these rules generalize across individuals and contexts.

Behavioral intention and behavior. Once a decision is made and a behavioral intention is formed, the corresponding behavior may or may not follow, depending on a variety of factors. For example, after developing intentions to experiment with tobacco, a young adolescent may be denied access to cigarettes by peers, siblings, or parents. Similarly, an experienced smoker may decide to quit, only to have his resolve weakened by withdrawal symptoms. The tenuous link between decision making and behavior is reflected by the broken line connecting these two concepts in Figure 1.

Implications for Smoking Prevention and Cessation Interventions

Despite significant advances in our understanding of the factors underlying adolescents' smoking behavior, most community- and school-based prevention and cessation programs report only modest success rates (Flay, 1987). Programs designed to educate adolescents about the negative health effects of smoking have

fared especially poorly (Bruvold, 1993; McCaul & Glasgow, 1985), with one notable exception being Project TNT's physical consequences program (Sussman et al., 1995). These less-than-encouraging results have led many researchers to conclude that altering expectancies is not an effective means of influencing adolescents' smoking behavior, and that this perspective should be discarded in favor of more promising approaches based on social influence and social learning. We believe that this negative assessment is premature. The mental models decision framework outlined in the previous section (see Figure 1) suggests that the path between providing new knowledge and changing behavior is full of potential obstacles. Nevertheless, it is a path that can be successfully navigated, provided sufficient attention is given to the processes underlying knowledge accessibility, expectancy generation, and the correspondence between intentions and behavior. In this section of the paper, we employ our framework to help explain why many previous smoking interventions based on the decision-making perspective have failed, and make suggestions for improving future interventions.

Our proposed framework suggests that adolescents' smoking intentions and behavior are primarily a function of their smoking expectancies, that is, what they expect to happen to them if they begin smoking, continue smoking, or quit smoking. Expectancies are assumed to be generated from mental models, which, in turn, are assumed to be constituted primarily from knowledge in memory, although the possibility of on-line construction of new knowledge is not ruled out. According to the framework, a number of factors may contribute to the high prevalence of tobacco use among adolescents.

Knowledge of negative smoking consequences is not present in memory, or knowledge is present but inaccurate. Knowledge gaps and misconceptions can negatively influence adolescents' tobacco use decisions in at least two ways. First, because current knowledge influences how new information is processed and interpreted, it may cause adolescents to misinterpret, discount, or in some instances completely ignore new information that could help them make better or more informed smoking choices. Knowledge gaps and misconceptions may also lead to the generation of inaccurate smoking expectancies, leading adolescents to engage in behaviors that may not be in their best interests. For example, many first-time smokers may incorrectly believe that experimenting with tobacco will not significantly increase their risk of becoming a regular smoker, when in fact there is considerable evidence to the contrary (e.g., Chassin et al., 1990; Russell, 1990).

At present, it is difficult to draw any firm conclusions about how much adolescents know about smoking and its effects. Several studies suggest that adolescents know that smoking is addictive and is a contributing cause of cancer (e.g., Northrup & Pollard, 1995; Viscusi, 1992). However, it is less clear whether they are equally knowledgeable about other negative health effects such as heart disease and emphysema. Little also appears to be known about the prevalence of smoking myths and

misconceptions among adolescents. Several studies suggest that adolescent smokers have a tendency to overestimate the number of their peers who also smoke (e.g., Petraitus, Flay, & Miller, 1995; Sussman et al., 1995). There is also evidence that misconceptions about smoking and cancer may be more prevalent in some cultural groups than in others (Crowe, Torabi, & Nakornkhet, 1994), suggesting the need for specialized intervention programs.

Adolescents' current knowledge has important implications for the implementation of smoking prevention and cessation interventions. If their knowledge is inaccurate and/or incomplete, our framework suggests that an important first step would be to provide them with accurate information. On the other hand, if knowledge is already reasonably accurate and complete, attention should be directed at ensuring this knowledge is accessible when smoking decisions are made, an issue that we turn to next.

Knowledge of negative smoking consequences is present in memory, but is inaccessible. The presence of smoking knowledge in memory does not guarantee that it will be available when smoking decisions are made. According to the semantic network model of memory outlined earlier, the probability that knowledge will be activated in a given context is a function of the number and strength of connections to other active nodes in the network. Interventions that do not encourage deep processing and cognitive elaboration are more likely to produce "weak" networks in which the new information is not well-integrated into existing knowledge. In such instances, contexts and stimuli that activate existing smoking knowledge (i.e., knowledge that currently guides decisions and related tobacco use) may not activate the new knowledge gained during the intervention.

Even if accurate smoking knowledge is present and active in memory, it will not automatically be incorporated into the decision maker's mental model of smoking consequences. As noted previously, a further winnowing process takes place in which only the most salient active knowledge is selected for inclusion in the model. This represents a significant challenge for anti-smoking interventions because, due to their immediacy, the positive social, physiological, and psychological consequences of smoking will often be more salient than the negative health consequences emphasized by most prevention and cessation programs (Sussman et al., 1995).

What steps can be taken to increase the probability that adolescents will incorporate "negative-consequence" information into their mental models when making smoking decisions? If salience is the main factor underlying knowledge selection, as Jungermann and Thüring (1987) suggest, several possibilities present themselves. One strategy for increasing the salience (and, hence, availability) of "negative-consequence" information is to present it in a novel and vivid manner. Rather than relying on dry technical reports and health statistics, interventions should employ innovative new teaching techniques that are more likely to interest and engage students. Such techniques might include multi-media decision support

systems, student video projects, smoking-related art projects, mock funerals for smokers, and other role-playing exercises (e.g., see Sussman et al., 1995). A second possible strategy to increase the salience of negative smoking consequences is to emphasize the personal relevance of this information. Given adolescents' predisposition to discount consequences that occur far into the future, it may be more effective to emphasize the immediate negative effects of smoking (e.g., bad breath, smelly clothes, peer disapproval, etc.) than to focus exclusively on long-term negative health effects, although this has yet to be demonstrated empirically (McCaul & Glasgow, 1985). A third possible strategy to increase salience involves repetition and rehearsal. Most models of memory (e.g., Anderson, 1983; Wyer & Srull, 1989) suggest that the more frequently a piece of knowledge is accessed from memory, the easier it will be to retrieve in the future.

Adolescents may "rationally" decide that smoking is in their best interests. Even if adolescents incorporate "negative-consequence" knowledge into their smoking mental models, they may still conclude that beginning or continuing to smoke is in their best interests. This might occur, for example, if satisfying particular social and/or psychological motives is perceived to be more important than avoiding the long-term negative health effects of smoking. In such circumstances, interventions should address the instrumental function(s) of smoking, and provide adolescents with less health-compromising alternatives for achieving highly desired outcomes. For example, social skills programs could expose adolescents to new strategies for gaining peer acceptance. If stress-reduction is identified as an important motive for smoking, relaxation and meditation techniques could be presented as alternatives.

Adolescents may develop strong anti-smoking intentions, but may be unable to translate these intentions into behavior. Even if adolescents decide that smoking is not in their best interest, other factors may intervene to prevent these good intentions from manifesting themselves in behavior. As noted earlier, physiological addiction is one factor that likely weakens the link between quitting intentions and actual quitting. In terms of smoking initiation, intentions not to experiment with tobacco may be undermined by a myriad of social influences that operate during adolescence. For example, consider the dynamics of a romantic relationship where one partner, a committed nonsmoker, is being pressured by the other to begin. The tenuous link between intentions and behavior suggests that, in many instances, simply educating adolescents about the negative consequences of tobacco (even if this is done using innovative procedures that ensure accessibility) may not be sufficient to significantly affect smoking behavior. Additional supports such as peer counseling and refusal skills training will also be needed to help ensure that anti-smoking intentions, once developed, are translated into behavior.

Conclusions

In the previous sections we have made several suggestions for designing more effective smoking prevention and cessation interventions based on our mental models decision framework. Many of the intervention features that we recommend are neither revolutionary nor particularly novel. In fact, many existing anti-smoking programs already incorporate at least some of these features. This leads to the question "If existing interventions are already doing what we suggest, why aren't they more successful?" Our theoretical framework suggests that, by themselves, none of the recommended features is sufficient to produce consistent or substantial shifts in smoking behavior. Teaching adolescents about the negative consequences of smoking may have little effect if this knowledge is inaccessible when smoking decisions are being made. Similarly, increasing accessibility of "negative-smoking-consequence" knowledge would be expected to have only a limited impact on smoking behavior if supports are not in place to facilitate the translation of anti-smoking intentions into behavior. In short, our framework suggests that anti-smoking programs need to systematically address all of the obstacles outlined above to be effective, not just one or two, as has been the case with many past interventions.

Although space constraints prevent a detailed description of what a smoking prevention and cessation program based on our framework might look like, a brief overview of one possible incarnation is provided below. The program could consist of two main components: a multi-media knowledge-based decision support system (KB-DSS) and an in-school clinic. The KB-DSS would guide users through the process of identifying possible positive and negative consequences associated with smoking and not smoking, assessing the probability and desirability of each possible consequence, and combining this information using a decision rule that is consistent with the user's motives (e.g., maximizing subjective expected utility, minimizing risk, etc.). At each stage in the decision process, the KB-DSS would identify possible deficiencies in the way that adolescents structure their smoking decisions and make suggestions for improving them. For example, if users fail to consider important negative health, financial, or social consequences of smoking when structuring their decisions, the program would provide additional information about these factors and their relevance to the decision at hand. If the probability of certain negative consequences, such as cancer or heart disease, is underestimated, the program would provide more accurate estimates. If users' response patterns indicate that they smoke primarily to reduce stress or gain peer acceptance, the program would provide alternative strategies to achieve these ends. To help ensure that new knowledge provided by the KB-DSS will be accessible, the program could employ a multimedia interface designed to be attractive to adolescents and maximize cognitive engagement. To help ensure that anti-smoking intentions are translated into behavior, the KB-DSS could also provide personalized prevention and

cessation strategies based on users' responses. The in-school clinic could provide peer support and other resources to further strengthen the link between intentions and behavior. Testing would involve comparing the effectiveness of the proposed program with existing programs both in terms of the critical processes identified by the framework and smoking outcomes.

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Hacks, Flacks, and Counter-Attacks: Cigarette Advertising, Sponsored Research, and Controversies

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The tobacco industry promotes friendly "experts" and uses public relations tactics to produce uncertainty around research results that threaten it. This inhibits public policies responsive to these research findings. These tactics, long used against medical science, are now being used to counter the studies challenging to the myth that cigarette advertising is of no import. The numerous weaknesses of the industry-advanced argument are discussed, drawing particularly on the literature of consumer behavior, marketing, and advertising. The vast preponderance of evidence indicates that cigarette advertising plays a meaningful role in influencing the perceptions, attitudes, and smoking behavior of youth. Denials of these effects, without brand new and compelling evidence, are highly suspect.

> *"The other side is engaging in a reckless campaign of propaganda, mistruths, half-truths, innuendo, false piety and downright deceit."*
>
> — Geoffrey Bible, Chairman & CEO, Philip Morris (Jones, 1996).

> *"The industry has consistently sought to obscure the epidemiological data linking tobacco use and disease while simultaneously contesting the science behind these studies."*
>
> — Arno, Brandt, Gostin, & Morgan, 1996, p. 1258

The tobacco industry is acknowledged as outstanding for its ability to promote "friendly" research, to denigrate research inimical to its interests as prohibitionist

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propaganda (Jones, 1996), and "to produce and manage uncertainty" (Proctor, 1995, p. 105). At their extreme, critics are denigrated as a conspiracy of overzealous crusaders exhibiting totalitarianism (Boddewyn, 1986b). The industry's strategy doesn't require winning or resolution of the debates its principals manage to create or inflame. It is enough to foster and perpetuate the illusion of controversy in order to "muddy the waters" around potentially damaging studies and streams of research. This serves at least two important ends: offering reassurance and a basis for rationalization to the otherwise concerned, thereby calming public opinion; and encouraging friendly, ignorant, or naive legislators away from relying on scientific findings threatening to the industry. These tactics are now being used on many fronts of the tobacco battlefield.

The tobacco industry's first major success with this strategy was in combating the so-called "health scare" from the early lung cancer studies of the 1950s. Industry leaders gathered seeds of doubt from around the world, and reproduced and disseminated these through a massive public relations machinery (Pollay, 1990b). Encouraged by that success, they have continued to muddy the waters around the scientific findings relevant to almost every aspect of tobacco and its control, including: heart disease; passive or second-hand smoke; addiction; the medical and larger social costs consequential to smoking; the economic consequences of regulation, etc. Where necessary, as in the case of indoor air quality, they have even turned small local businessmen into apparent international authorities (Mintz, 1996). Of course, they prefer to employ those who seem to be independent from the industry, because trade organizations like the Tobacco Institute are admittedly biased. "We don't pretend to be objective, unbiased or fair. . . . We represent a commercially vested interest." (Cosco, 1988, p. 18). It should be no surprise, then, that these tactics are also used to combat the issue of cigarette advertising and its effects, particularly its role in recruiting new smokers.

For example, when Fischer et al. (1991) measured product logo recognition of three-to-six-year-olds, they found over 90 percent of the six-year-olds could correctly match the cartoon Camel with cigarettes. So threatening was this result that industry-hired academic consultants attacked the study with or without the benefit of added research (Boddewyn, 1993; Martin, 1993; Mizerski, 1995). Their primary line of attack was to allege that this work was methodologically "inferior," in part because it had been authored, reviewed and published by and for medical experts, rather than marketing or advertising experts. The finding of high awareness among the very young has since been replicated by marketing academics (Henke, 1994), and even by the R. J. Reynolds-sponsored researcher (Mizerski, 1995), although this report is notable for downplaying this embarrassing fact and, instead, emphasizing allegations of methodological weaknesses of the original. More recently, Pollay's (1996) report that teens were three times as responsive to cigarette advertising as adults drew instant and inaccurate attacks from the

Tobacco Institute as "a great deal of sound and fury signifying nothing" and "flatly contradicted" by a study sponsored by R. J. Reynolds (Stolberg, 1996).

The standard response of the industry to concerns about children and cigarette advertising has been to insist that "kids just don't pay attention to cigarette ads . . . (Our advertising) purpose is to get smokers of competitive products to switch . . . virtually the only way a cigarette brand can meaningfully increase its business" (R. J. Reynolds, 1984), a thesis uncritically echoed by some others (e.g., Boddewyn, 1986b). The belief and assertion is that cigarette advertising is of little consequence, at least with respect to the young (e.g., Boddewyn, 1989; Reid, 1989; Ward, 1989). This assertion, so counter to common sense, is argued on theoretical grounds. Because cigarettes seem to be a so-called "mature" industry, i.e., one which has completed its dynamic growth and reached a stasis, it is claimed that its advertising and promotional activity can and does affect only brand-switching behavior among established adult smokers. By neither intent nor effect, tobacco industry magnates would have us believe, does cigarette advertising influence young people, reassure and retain existing smokers who might otherwise quit, or induce current smokers to smoke more—several of the ways in which advertising might conceivably influence primary demand.

The purpose here is to identify and outline the several lines of argument and evidence which contradict these assertions by the tobacco industry and its allies, as enumerated in Table 1. This is done from a marketing, advertising and consumer behavior perspective, based on my experience as marketing professor and researcher in a business school. My previous research has noted the industry's research on the behavior of eleven-, twelve-, and thirteen-year-olds, their explicit targeting of fifteen-year-olds, their efforts to promote social acceptance and peer pressure, and their use of images of independence to appeal to the pressing adolescent need for autonomy (Pollay & Lavack, 1993). Recent research found that, regardless of intent, the effects of cigarette advertising are three times the magnitude among teenagers as they are among adults (Pollay et al., 1996). Other studies have documented the low level of information in cigarette advertising (Pollay, 1989), the uses of "pictures of health" (Pollay, 1991), the public relations creation of controversy and scattering of "seeds of doubt" (Pollay, 1990), the failure of cigarette self-regulation (Pollay, 1994b), and other historical aspects too numerous to list. I have shared some of my knowledge with juries in American liability trials, and in the constitutional defense of Canada's effort to curtail these industry inducements. The more I've learned from my own research and trial evidence, the more certain I am that cigarette advertising is not innocuous in either intent or effect. The more I've learned, the less credible and ethical I find the speculations and rationalizations by others hired by the industry to make it seem innocuous (Pollay, 1993b).

Table 1. A Pack of Reasons to Doubt Tobacco Industry Assertions that Cigarette Advertising Has No Effect on the Young and Starting Smoker

1.	The classification of cigarettes as a "mature market" is simplistic.
2.	No known industry documents employ the classification of cigarettes as a "mature market."
3.	Empirical evidence contradicts the classification of cigarettes as "mature market."
4.	Enormous promotional budgets cannot be justified by "adult brand switching" alone.
5.	No isolation or immunity protects youth from cigarette ads.
6.	Advertising gives the cigarette "friendly familiarity."
7.	The perceptions and judgments of youth are known to be biased.
8.	Cigarette imagery appeals to adolescents.
9.	The tobacco industry has long displayed a strategic interest in youth.
10.	Adolescence is a time of identity formation and advertising attentiveness.
11.	Youths are persuasion-coping novices.
12.	Cigarette addictiveness and brand loyalty make adults proverbial "old dogs."
13.	Youths are strategically more attractive than adults.
14.	Teens are three times more responsive than adults to cigarette ads.
15.	Industry apologists typically offer weak research, or none at all.
16.	Apologists supporting the industry are admittedly biased.
17.	Econometric analysis of aggregate data proves little.
18.	The best cross-cultural research shows ad bans to have impact.
19.	Advertising experts and trade journals discredit the industry's stance.
20.	The industry's latest position is illogical and ludicrous.

A Pack of Reasons to Doubt Industry-Advanced Claims and Denials

"I am distressed at the venality, duplicity, and general lack of morals of those who testify in government hearings against the cigarette-advertising ban or a warning requirement. . . . Perhaps they are merely men of zero integrity."

— Simon, 1970, p. 253

No Known Industry Documents Employ the "Mature Market" Concept

To date, no corporate documents have been produced in litigation or research reports to verify that the "mature market" classification is relied upon by the industry in its internal strategic analyses, nor has any evidence of any kind been offered in support of the "mature market" opinions expressed by industry-advanced experts like Ward (1989). Reid (1989), when testifying for the industry, ignored the literature equivocal about the concept's validity, the literature specific to the cigarette industry, and the contradictory profit and advertising expenditure data. He ignored all the many corporate documents produced in the same litiga-

tion documenting the consumer research and advertising strategies focused on young starters (Pollay & Lavack, 1993). He even ignored his own observation, surely fitting cigarettes, that given "the existence of an undesirable image, advertising can play a major role" (Reid & Rotfeld, 1976, p. 26). Testimony like this that offers theoretical conjectures, while ignoring the relevant literature and the available case facts, is not merely speculative, but quite literally ignorant and prejudicial.

The Classification of Cigarettes as a "Mature Market" is Simplistic

Many marketing and advertising textbooks do not even mention the product-life-cycle concept from which the "mature market" hypothesis derives. The product-life-cycle notion is that products go through predictable phases from being new technologies with little competition and small special interest markets to being fully developed and saturated with many competitors. When this concept is discussed in texts, it is treated only as a pedagogical generalization, and far from the "fundamental law" with invariant implications alleged by Reid (1989). As a generalization across many industries, "the empirical evidence of the existence and pervasiveness of the product-life-cycle concept is quite uneven" (Lilien, Kotler, & Moorthy, 1992, p. 513). Even were this generalization valid, it is not at all obvious that it would apply well to tobacco, for the tobacco industry is unique in the addictive and deadly nature of its products, and the associated publicity and marketing problems that these facts present. It also has a unique legislative history and an oligopolistic market structure dominated by a few giant firms.

Empirical Evidence Contradicts the Classification of Cigarettes as "Mature Market"

The simple diagnostic tests indicative of "mature markets," such as diminished profitability and ad spending, are failed by the cigarette industry. A leading advertising industry spokesman stated that ad strategies for mature products "*always* specify the competitive brand from which the volume will be taken" (Colford, 1986, emphasis added). The industry fails this diagnostic test, too. This shouldn't surprise knowledgeable advertising professionals, since J. Walter Thompson, a leading international ad agency, tried to apply this concept to the cigarette industry long ago. No matter whether considering product class (e.g., cigarettes), product form (e.g., filter cigarettes), or brand (e.g., Winston), "it is not possible to validate the model at any of these levels of aggregation" (Dhalla & Yuseph, 1976, p. 103, examples in original). It unambiguously exhorted other researchers to "Forget the Product Life Cycle Concept."

Enormous Promotional Budgets Cannot be Justified by "Adult Brand Switching" Alone

The cigarette market may seem, to the naive, to be stable and, therefore, to be a so-called "mature market" because total sales seem nearly constant. This appearance, however, hides the dynamics of substantial rates of quitting attempts, quitting successes, and dying—and the countervailing rates of recruitment of hundreds of thousands of new smokers. Maintaining constancy of market size involves recruiting over a million new smokers a year, and almost all smokers are recruited as minors, not as consenting adults.

Brand-switching alone cannot easily justify the enormous advertising and promotional expenditures, over $6 billion a year in 1993, larger than Hollywood's gross income from the United States and Canada combined (Kilday & Thompson, 1995). Brand switchers are an unattractive market segment, as they are typically older, health-concerned, or symptomatic smokers, thus relatively frail in constitution, in addition to being fickle by definition. They are also few in number. Siegel et al. (1996), after noting that less than 10 percent of smokers will switch in any given year, estimate that the total profit from all "company switching" was $362 million, small compared to the costs of the battle of these brands. Accounting for sales in future years, the net present value of a new smoker to the cigarette companies has been estimated as US $1,085 (Tye, Warner, & Glantz, 1987).

If cigarette advertising had no effect on smoking recruitment, as the industry contends, a ban on advertising expenditures of this magnitude should and would be welcomed by savvy oligopolists like the tobacco industry. Indeed, a ban would benefit the larger firms the most, by saving them the enormous promotional expense and helping to freeze their large market shares. Thus, if advertising had no effect on primary demand, profit-maximizing firms and industries would curtail advertising competition, just as they would refrain from cut-throat price competition, and the largest firms would be expected to act as leaders in this self-restraint. Failing a tacit collusion to this end, the industry would eagerly seize the opportunity provided by regulatory proposals to ban advertising, with the larger firms the most motivated to do so. The fact that cigarette companies, led by the largest, are lobbying so hard against advertising bans or controls of any kind is illogical—unless the advertising and promotion has the effect of enticing new smokers. As Davis (1996, p. 3) stated: "The reason for the industry's failure to support a federal ban on tobacco advertising must be that . . . the companies must indeed perceive an industry-wide benefit to advertising and promotion." Failing that, they could save themselves all the spending on advertising that only attacked or defended market shares.

No Isolation or Immunity Protects Youth from Cigarette Ads

There is no way to isolate teens and pre-teens from popular culture and media, including cigarette advertising's inducements. The absence of a "magic curtain" around children obviates any "convincing defense of a view that would make young nonsmokers immune." (Cohen, 1990, p. 240–241.) Those empowered with self-regulatory responsibilities in the National Association of Broadcasters (NAB) saw this vividly for the medium of television: "The difficulty in cigarette advertising is that commercials which have an impact upon an adult cannot be assumed to leave unaffected a young viewer, smoker or otherwise." (Bell, 1966, p. 30–31.) Even a Marlboro ad man admitted after retiring, "I don't know any way of doing this that doesn't tempt young people to smoke." (Daniels, 1974, p. 245.) Consistent with these views, newer research indicates that the likelihood of adolescent smoking is related to ad exposure rates (Botvin et al., 1993).

Advertising Gives the Cigarette "Friendly Familiarity"

Cigarette advertising is so pervasive and ubiquitous that cigarettes are a cultural commonplace, taken for granted by the public, and treated as less risky than appropriate. We are all aware of the reverse of this, when we feel suspicion of the unfamiliar. This positive effect is called "friendly familiarity" by advertising professionals (Burnett, 1961, p. 217).

"The ubiquitous display of messages promoting tobacco use clearly fosters an environment in which experimentation by youth is expected, if not explicitly encouraged" (Bonnie & Lynch, 1994, p. 34). "The kind of advertising that is almost everywhere makes cigarets (*sic*) respectable and is therefore reassuring," according to Social Research Inc. (*Cigarets: who buys*, 1952, p. 23). Repetition, oft referred to as the soul of persuasion, likely biases both risk and social perceptions, such as assessments of smoking prevalence, and/or the social acceptance experienced by smokers, according to both consumer behavior and psychology experts (e.g., Cohen, 1990; Fishbein, 1977). This phenomenon is well known to psychologists as the "familiarity effect" (Zajonc, 1980).

The Perceptions and Judgments of Youth Are Known To Be Biased

The young do, in fact, overestimate the prevalence of cigarette smoking among both peers and adults, and the degree of this overestimation is among the strongest predictors of smoking initiation (e.g., Chassin et al., 1984). They also underestimate the negative attitudes of peers and the risks to which they personally are exposed should they smoke. Youths are also inclined to manifest an "invulnerability syndrome" (Greening & Dollinger, 1991). Youths tend to both "exaggerate the social benefit (by overestimating the prevalence and popularity of

smoking among peers and adults) and to underestimate the risks (by underestimating the prevalence of negative attitudes toward smoking held by their peers)" (Bonnie & Lynch, 1994, p. 34). Another literature review concludes that "cigarette advertising appears to influence young people's perceptions of the pervasiveness, image, and function of smoking. Since misperceptions in these areas constitute psychosocial risk factors for the initiation of smoking, cigarette advertising appears to increase young people's risk of smoking" (USDHHS, 1994, p. 195). These facts seriously undermine the notion that the uptake of smoking is an informed choice or decision (Leventhal, Glynn, & Fleming, 1987). Irrespective of this naiveté, it is a misbehavior of minors, not consenting adults.

Cigarette Imagery Appeals to Adolescents

Cigarette ads often feature veritable pictures of health, depicting bold and lively behavior typically in pure and pristine outdoor environments (Pollay, 1991, 1993a; USDHHS 1994). The images of cigarette ads portray themes known to appeal to young people, such as independence, adventure seeking, social approval, and sophistication. The theme of independence, in particular, so well captured by the Marlboro Man, strikes a responsive chord with the dominant psychological need of adolescents for autonomy and freedom from authority. Adolescent girls feel the same needs for autonomy as do boys, accounting for the otherwise surprising popularity of the Marlboro brand among girls. Motivation research confirms the insights of previous advertisers and public relations professionals in seeing smoking as an expression of freedom and worldliness for women (Martineau, 1957). It seems no coincidence that marketers of female brands "try to tap the emerging independence and self-fulfilment of women, to make smoking a badge to express that" (Waldman, 1989, p. 81).

In addition, some of the models in cigarette advertisements appear particularly youthful (Mazis et al., 1992). This isn't all that common, however, as cigarette firms know that teens desire symbols of adulthood, not symbols of youth (e.g., hard rock vs. "bubble gum" music). Imagery-based ads are potentially insidious, in contrast to verbal assertions which require cognitive processing. Imagery is taken in at a glance, experienced more than thought about, tending to "bypass logical analysis." Because of this, imagery advertising is deemed "transformational" rather than informational (Cohen, 1990). The old adage says "seeing is believing," and cigarette ads use carefully tuned images to create positive experiences, while being careful to avoid precipitating cognitive counterargumentation.

The Tobacco Industry Has Long Displayed a Strategic Interest in Youth

The industry has demonstrated an interest in the youth market in its planning documents, market research activities, and media plans for many decades (USDHHS, 1994, Pollay, 1995). Ads have been placed on billboards near schools and malls, and in after-school radio spots with effective reach into youth markets. The TV advertising schedules bought in the 1960s reflected a preference for those times with the higher proportions of delivered teenagers, not adults (Pollay, 1994a, 1994b). R. J. Reynolds' 1973 "Research Planning Document on Some Thoughts about New Brands for the Youth Market" described programs for appealing to "learning smokers" (Schwartz, 1995). Philip Morris found that almost half of the nonsmoking girls "share many of the same values as the smokers—and are highly exposed to the total smoking environment. We call them the 'Vulnerables' for, on the surface, they appear to be ready candidates for the next wave of new smokers." (Udow, 1976, H7664.)

Copy concepts for many brands focus on independence, with the adolescent need for autonomy and self-reliance known by the industry to be a dominant one (USDHHS, 1994). The success of starter brands, according to trial evidence, is the result of carefully planned and executed strategies, guided throughout by extensive research (Pollay & Lavack, 1993). Corporate research documents discuss the behavior, knowledge, and attitudes of eleven-, twelve-, and thirteen-year-olds, and media plans specify targets beginning at age fifteen, with willingness to pay as much for ad exposures to fifteen-year-old nonsmokers as to smokers. R. J. Reynolds' Canadian affiliate, for example, commissioned customization of "Youth Target Study '87" and got extensive data on subjects as young as fifteen.

The need to have a strategic interest in youth has long been recognized by the industry, and used to be freely admitted to. For example, just before the Surgeon General's Report of 1964, an advertising trade magazine, *Sponsor* ("What will happen," 1963), noted pro-health education with concern and asked: "If, however, impressionable youngsters are now approached mostly by the anti-smoking fraternity, how will cigarette sales fare 10 years hence?" Note, too, that this also demonstrates the long time spans appropriate in understanding cigarette advertising's effects, which are generational rather than instantaneous, inculcative rather than impulse-generating.

Adolescence Is a Time of Identity Formation and Advertising Attentiveness

"Cigarette advertising's cultural function is much more than the selling of cigarettes. Its collective images represent a corpus of deeply rooted cultural mythologies that are not simply pieces of advertising creativity, but icons that pose solutions to real, experienced problems of identity." (Chapman & Fitzgerald, 1982, p. 494.) The National Association of Broadcasters knew this when trying to help the

industry self-regulate TV ads. "The adult world depicted in cigarette advertising very often is a world to which the adolescent aspires. . . . To the young, smoking indeed may seem to be an important step towards, and a help in growth from adolescence to maturity." (Bell, 1966, p. 30–31.)

Youths are alert to popular culture for cues and clues as to what's hot and what's not. They attend to advertising for symbols of adulthood, but pay only scant attention to warnings (Fletcher et al., 1995). "Teens are also more susceptible to the images of romance, success, sophistication, popularity, and adventure which advertising suggests they could achieve through the consumption of cigarettes." (Nichter & Cartwright, 1991, p. 242.) Even brief cigarette ad exposures in lab settings can result in more favorable thoughts about smokers, enhance attitudes, increase awareness and change brand preferences of the young (Hoek, Gendall, & Stockdale, 1993; Pechmann & Ratneshwar, 1994).

This is consistent with consumer behavior knowledge as reflected in textbooks and journals. "Teenagers have become increasingly aware of new products and brands. They are natural 'triers'." (Loudon & Della Bitta, 1993, p. 151.) They have "a lot of uncertainty about the self, and the need to belong and to find one's unique identity . . . (so) teens actively search for cues from their peers and from advertising for the right way to look and behave . . . (becoming) interested in many different products" that can express their needs for "experimentation, belonging, independence, responsibility, and approval from others." (Solomon, 1994, pp. 503–504.) By high school, possessions and "badge products" like cigarettes are used as instruments for defining and controlling relations between people (Stacey, 1982).

As a 1974 RJR memo states: "To some extent young smokers 'wear' their cigarette and it becomes an important part of the 'I' they wish to be, along with their clothing and the way they style their hair." (Schwartz, 1996, p. A3.) One starter brand in Canada, according to the R. J. Reynolds affiliate who marketed it, was popular with "very young starter smokers . . . because it provides them with an instant badge of masculinity, appeals to their rebellious nature and establishes their position amongst their peers." (Pollay & Lavack, 1993, pp. 268–269.) Adults, in contrast, are not caught up in the processes of identity experimentation and formation. They are not as searching of their environment for consumption items symbolic of aspirational identities.

The image and badge aspects of brands are especially important to ethnic minorities. "While this is of utmost importance when marketing cigarettes in general, we feel it assumes even more importance when marketing cigarettes to blacks. Because blacks in general tend to be more insecure, for obvious reasons, it is critical that the public cigarette badge they adopt be one that supports what they are looking for in terms of psychological reassurance." (Reeves, 1979, p. 3.) Thus, the Newport name has the virtue of connoting "quality and class," because of associations with status symbols such as Newport Beach and the Newport Jazz Festivals.

Youths Are Persuasion-Coping Novices

The young, as consumers, tend to be less experienced in counterarguing against advertising and selling tactics, as well as more brand-conscious than older consumers (Brucks, Armstrong, & Goldberg, 1988; McNeal, 1992). They are also less experienced as shoppers, with fewer experiences of salesmen and persuasion tactics. Friestad and Wright (1994, p. 7) note that "novices in coping with advertising or selling encounters may recognize only simple, superficial patterns in these events and have little proficiency with self-regulatory processes . . . (and) coping strategies." Adults, with their longer histories, particularly as smokers, have less interest in, and greater resistance to, the temptations and appeals of most new brands and/or ad campaigns.

Cigarette Addictiveness and Brand Loyalty Make Adults Proverbial "Old Dogs"

Cigarettes enjoy phenomenally high brand loyalty, the highest of all consumer products (e.g., Alsop, 1989). A relatively low rate of brand switching is the norm, usually 10 percent or less (Cohen, 1990, p. 239; FTC, 1985; Gardner, 1984; Siegel et al., 1996). Some of this nominal switching occurs only within brand families (e.g., from Brand X milds to Brand X lights), and is of little net consequence to the firm's sales or net profit. The high brand loyalty that naturally results from nicotine "satisfaction" of addictive physiological needs makes it very difficult and expensive to convert competitors' customers to your brands. Also, the bulk of the brand switching is the behavior of older, health-concerned or symptomatic smokers who are trading down, typically within a brand family, to products with lower tar and nicotine labeling, in the mistaken belief that those products are safe(r), a belief fostered by years of advertising.

Youths Are Strategically More Attractive Than Adults

The trade of these older customers offers firms very little future and net present value, compared with the value inherent in attracting young starters, the bulk of whom will be brand-loyal (Tye, Warner, & Glantz, 1987). "This is a time when brand loyalties may be formed that could last well into adulthood" (Loudon & Della Bitta, 1993, p. 152, citing Moschis & Moore, 1981). The young are a "perpetually new market . . . thus a marketer must not neglect young consumers who come 'on stream' if the company's brand is to have continued success in the older-age market" (Loudon & Della Bitta, 1993, p. 155). Teens are a strategically important target audience, because brand loyalty is often developed during this time and this creates a "barrier-to-entry for other brands not chosen during these pivotal years" (Solomon, 1994, p. 504).

The death and quitting rates among aging smokers means that sales would drop rapidly were it not for a continuing influx of new starters. This strategic situation has been obvious to the industry for some time. R. J. Reynolds' research and development officers wrote in 1973: "Realistically, if our Company is to survive and prosper, over the long term, we must get our share of the youth market" (Schwartz, 1995). Contemporary corporate documents echo this idea, stating that "young smokers represent the major opportunity group for the cigarette industry," and "if the last ten years have taught us anything, it is that the industry is dominated by the companies who respond most effectively to the needs of younger smokers" (Pollay & Lavack, 1993, p. 267).

Teens Are Three Times More Responsive Than Adults to Cigarette Ads

The latest research (Pollay et al., 1996) uses state-of-the-art techniques to analyze market share as a function of relative advertising, also known as *share of voice*. This measures the impact of cigarette brand advertising on realized market shares, allowing for both current and historical effects of advertising for nine major brands over twenty years. The results, which are robust under many alternative assumptions, show that brand choices among teenagers are significantly related to relative cigarette advertising. Moreover, the relationship between brand choices and brand advertising is significantly stronger among teenagers than among adults by a factor of about three. The greater advertising sensitivity among teenagers is in part due to *scale* (i.e., high fractions of teens concentrated on highly advertised brands), and in part due to *dynamics* (i.e., teen purchase patterns being more responsive to changes in advertising intensity). Further, the impact of advertising on brand choices among youth apparently cannot be dismissed as an inappropriate attribution (i.e., teenagers actually imitating adult brand choices rather than responding to advertising). Even when this aspect is factored into the analysis, the result remains consistent.

Greater advertising sensitivity among youth is consistent with earlier observations that brand choices of youth are highly concentrated on the most heavily advertised brands (CDC, 1992, 1994). California's Operation Storefront also found that "heavy advertising in stores exactly matches the brand preferences of children who smoke . . . but the ad prevalence does not match adult smoker preferences." (Hilts, 1995, p. B10.) "Young people know advertising better, appreciate brand-stretching advertising more," and their ideal self-image matches the images offered by cigarette brands. (Rombouts & Fauconnier, 1988; see also Aitken et al., 1987.) A recent study (Pierce & Gilpin, 1995a, 1995b; Pierce, Lee, & Gilpin, 1994) reported data indicating that smoking rates among young women increased sharply in the late 1960s, coincidental with the launch of Virginia Slims and other nominally "female" brands.

Industry Apologists Typically Offer Weak Research, or None At All

The so-called "experts" that the industry gets to testify in courts and before legislative groups almost always offer opinions that are conspicuously ignorant of true corporate activity. Instead they opine based upon simplistic theorizing and conclusions. Martin told a court that cigarette ads can be of no appreciable import, no matter what their content or character, insulting the competencies of many advertising agencies, and judging their diverse efforts as all failing to alter public perceptions of the product, either individually or collectively. Perhaps the most simplistic and common position used to exculpate the industry is the "mature market" theory, discussed above, typically asserted with no corroborating evidence, perhaps because there is none to be had.

The industry has long relied on Boddewyn to argue that cigarette advertising doesn't influence children, but the survey methodology and logic reported in Boddewyn (1987) is totally inadequate, biased, and superficial. This research was sponsored by the international tobacco industry lobbying organization, conducted by a British contract research firm, and published by an American advocacy organization, not by a peer-reviewed scholarly journal or scientific body. Its conclusion is based solely on a self-report question asking children to select, from a list of thirteen offered reasons, only the most important reason for smoking their first cigarette. This question is, to my knowledge, without precedent in either academic research or trade practice as the sole means of validly assessing advertising's role and effects. Not surprisingly, few choose "I had seen advertising" as the most compelling reason, since to do so requires that advertising's influence be consciously appreciated, willingly admitted to, and predominant among all of the prompted reasons, rather than just a contributing factor. One wonders how many might have agreed or disagreed with a statement like "advertising makes cigarettes seem attractive." While the apologists for the cigarette industry have ignored this grievous weakness, they dramatically raise their critical methodological standards when encountering results threatening their tobacco clients' economic or legal interests (e.g., Boddewyn, 1989). Martin (1993), for example, took the initiative to canvas researchers with a detailed questionnaire soliciting criticism of Pierce et al. (1991), who had found the cartoon Camel well known to the very young, while never commenting on the fallaciousness of Boddewyn's data and conclusions, and his client's political use of same.

Apologists Supporting the Industry Are Admittedly Biased

Boddewyn, for one, at least, admits to being "biased because I have served as a paid expert witness for the tobacco industry." (Boddewyn, 1989, p. 1255.) He portrays health educators and promoters as "overzealous crusaders," characterized by anti-democratic "totalitarianism" and hypocrisy, even suggesting that their concern

with smoking and health might be a "conspiracy" (Boddewyn, 1986b, pp. 323–326). The work offered as objective research by the industry to support its positions includes those self-described as "prepared by and from industry sources" (Boddewyn, 1986a, p. 1) and described elsewhere as being "at the heart" of the International Advertising Association's vested interest efforts to block regulation of advertising (Bruce, Keller, & Cunard, 1985, pp. 28–29). Despite its manifest bias and many methodological weaknesses, this pamphlet has been described by advocates as "proof" that cigarette ad bans don't work.

Econometric Analysis of Aggregate Data Proves Little

Most econometric research has various measurement and estimation problems, and these tend to increase the likelihood of finding ambiguous results (Arbogast, 1986; Chapman, 1989; Franke, 1994). Econometric research characteristically looks at total cigarette sales for a time period and attempts to statistically relate these sales to total advertising expenditures for that and previous time periods. Common problems include a lack of experimental controls and/or systematic variation of the key variables; the omission of key variables such as anti-smoking public health programs; the mis-specification of key variables and their role; and the use of inappropriate criteria such as total sales, rather than something more specific, such as brand shares, the number of starters, smoking rates among youth, or quitting rates. At best, the relating of aggregate sales to aggregate advertising can only measure marginal impacts of the often proportionally small changes in actual aggregate advertising spending. It is not surprising, therefore, that results are typically ambiguous or seem small in magnitude. This suits the industry, as it uses them as so-called "proof" that advertising is, in fact, of little import.

The methodological issues, however, pale in importance compared to this erroneous interpretation of the results. At best, these studies estimate point elasticities of demand around current spending levels. If these elasticities were large, the firms would have a strong incentive to spend more. Therefore, we would expect that discovered point elasticities around current spending levels should be low, as is often found, presuming current spending to be approximately optimal. Too often, the equivocal results or small observed elasticities are illogically used to support the position that cigarette advertising bans would have no effect on consumption. Generalizing from studies of small variation to the import of a total ban is an enormous stretch and clearly fallacious. Expressed formally, "the nonsignificance and small magnitude of the estimated elasticities do not speak to the effects of a total ban on cigarette advertising" (Franke, 1994, p. 39). More simply, consider the inappropriateness of a gardener with meager results from a study of minuscule variations of rainfall on plant growth during a normal year, concluding that these plants would be totally unaffected by a complete drought.

The Best Cross-Cultural Research Shows Ad Bans To Be Impactful

A meta-analysis, aggregating data and results across many studies, found a significantly positive elasticity of demand with respect to advertising, despite the issues described above (Andrews & Franke, 1991). This review summarized the many time-series analyses of industry aggregate sales as a function of aggregate advertising and other variables, such as price. There were forty-eight such studies, which collectively covered the period from 1933 to 1990. Of these, twenty-five were based on U.S. data, with another thirteen from the United Kingdom. The advertising elasticity was positive, and appeared to decline over time, as ad spending was simultaneously becoming a smaller fraction of the total promotional budget. Other meta-analyses and international literature reviews have reached the same conclusion: that advertising and its regulation has an influence on primary demand in exactly the manner that common sense dictates (Laugesen & Meads, 1991; Toxic Substances Board, 1989; USDHHS, 1989). Advertising promotes consumption and regulation reduces promotional impact.

Advertising Experts and Trade Journals Doubt the Industry's Stance

Many ad executives, when confronted with the pioneering Surgeon General's Report, admitted that cigarette advertising influenced minors. John Orr Young, whose agency, Young & Rubicam, had cigarette experience, said that: "Advertising agencies are retained by cigaret (*sic*) manufacturers to create demand for cigarets among both adults and eager youngsters. The earlier the teen-age boy or girl gets the habit, the bigger the national sales volume" ("Agency would refuse," 1964a). Another leading advertising executive, the president of McManus, Johns, & Adams felt that "There is no doubt that all forms of advertising played a part in popularizing the cigaret (*sic*)" ("Make cigarets," 1964b.)

Emerson Foote, a founder of Foote, Cone, and Belding, and later CEO of McCann-Erikson, bluntly debunked the industry claims that its advertising affects only brand switching and has no effect whatsoever on recruitment. "I don't think anyone really believes this . . . I suspect that creating a positive climate of social acceptability for smoking, which encourages new smokers to join the market, is of greater importance to the industry . . . In recent years the cigarette industry has been artfully maintaining that cigarette advertising has nothing to do with total sales. Take my word for it, this is complete and utter nonsense" (Foote, 1981).

More currently, one advertising CEO comments generally that cigarette advertising is "even sicker than war. If you were to choose the ultimate insanity of our society, I'd put cigarette advertising at the top" (Horovitz, 1996). Another wrote about the cartoon Camel: "Those of us in the marketing business know exactly what he's up to; we should be the first to denounce him" (DesRoches, 1994). A Philip Morris executive adds, "You don't have to be a brain surgeon to see what's going on.

Just look at the ads. It's ludicrous for them to deny that a cartoon character like Joe Camel isn't attractive to kids" (Ecanbarger, 1993). This cartoon campaign has been described as "one of the most egregious examples in recent history of tobacco advertising targeted at children," encouraging even *Advertising Age* editors to urge that it be dropped (Cohen, 1994, p. 12).

The Industry's Latest Position Is Illogical and Ludicrous

The industry and its spokespersons would now have us believe that they have no influence at all on smoking onset, but that both their intent and the effect is exclusively on brand choice among existing smokers, now apparently admitted to include minors. When Pollay et al. (1996) reported on the impact of advertising on teens, a coalition of advertising groups, the Freedom to Advertise Coalition, said it "proves what we have been saying all along—that tobacco advertising is geared to influence market share among those people who already smoke" (Stolberg, 1996). This is saying that the firms' intentions and abilities are such that "we don't encourage children to smoke, only to switch brands." This has been satirized in editorial cartoons as a denial that cigarette advertisers entice kids to start smoking, because their marketing is aimed precisely at the second cigarette they smoke, not the first.

Research shows that the very young are aware of cigarette icons and associate these with both the product and brand. We also know that teens who have started smoking are substantially more affected by cigarette advertising than are adult smokers. Are the ones having their attitudes shaped at an early age all destined to make the perverse decision, from the advertisers' view, not to become smokers? Are the only ones who start smoking those who have had no awareness of, or attraction to, cigarette advertising they were exposed to while growing up (if, indeed, there can even be such a group of people)? Are those who start smoking, presumably despite their blindness and/or numbness to prior cigarette promotion, supposed to become instantly hypersensitive to it? Are we to believe that the children who have ignored advertising throughout their formative years suddenly are the only ones impacted by it?

As the perceptions, attitudes, and beliefs governing brand choice are influenced by cigarette advertising, it is totally implausible that those same brand perceptions, attitudes, and beliefs have no influence whatsoever on the temptation to start smoking. It is impossible to advertise a specific brand without also simultaneously advertising cigarettes as a product class. A Philip Morris marketing vice president, famous for managing Marlboro's success, once said, "A cigarette company's ads are not just competing with ads for other brands. You are competing with every other advertiser in America for a share of the consumer's mind" (Whiteside, 1974, p. 133). Advertising that makes a cigarette brand attractive inevitably also makes cigarette smoking attractive, at the very least the smoking of that brand. There is no known way to advertise so that only brand switching, but not product interest, is affected.

Conclusion

Creating the illusion of controversy is a worn-out tactic, and ought to be treated with incredulous cynicism by scholars and policymakers. In fact, there seems to be far less controversy about the role of advertising than a strong convergence of diverse streams of research and analysis. Strategic analysis indicates that new users are far more attractive to firms than the few, frail and fickle brand switchers. Historical analysis documents the industry's long-standing strategic interest in youth. Analysis of contemporary corporate documents shows this to be an intensifying interest, for it is among minors where virtually all starting of smoking occurs, and starting now occurs at younger ages than ever before. Content analyses of advertising show that cigarette advertising imagery is largely pictures of health and images of independence, known by the industry to resonate with adolescent needs for autonomy and freedom from authority. Behavioral analyses show that cigarette advertising constitutes a psychosocial risk factor. Not only is teen smoking behavior related to past and present advertising, but also this relationship is about three times stronger among teens than among adults. Meta-analysis has shown cigarette advertising elasticity to be positive.

This has important public policy implications. Whether intended or not, cigarette advertising is significantly related to youth smoking behavior. To the extent that advertising influences the use of cigarettes among a consumer group to whom their sale is illegal, the government has a legitimate interest in regulating cigarette advertising. Convergent analyses and results suggest that regulating cigarette advertising may be an effective policy intervention to influence smoking behavior among adolescents. This should at least address advertising whose character is likely to appeal to the young, and placement in media where exposure to the young is inevitable. The authors of the Institute of Medicine's literature review recommend that this be done at federal, state, and local levels, although this would require repealing current pre-emptive federal legislation (Bonnie & Lynch, 1994). For more on legislative options with respect to tobacco advertising, see Arbogast (1986), Blum and Myers (1993), Burns (1994), and Pytte (1990).

Given the many various analyses and diversity of evidence, it seems an inescapable conclusion that cigarette advertising plays a meaningful role in influencing the perceptions, attitudes, and smoking behavior of youth. It also seems appropriate for scholars to react to assertions that there are no such effects on youth with disbelief, and to suspect industry sponsorship as a likely basis for such assertions.

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Historical Overview of Tobacco Legislation and Regulation

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In this paper we describe the legislative and regulatory history of tobacco control efforts and discuss the ways in which the debate over tobacco control has been framed. From a regulatory perspective, primary concern is how to balance the individual's legal use of tobacco products with society's obligation to limit the use of a lethal product. Our review demonstrates the progress tobacco control advocates have made in enacting statewide legislation and local ordinances, especially during the past fifteen years, to restrict both smoking in public places and youth access to tobacco products. Nevertheless, this progress may be threatened by a powerful and determined tobacco industry. We discuss various strategies for determining how and where to allocate tobacco control resources.

The use and regulation of tobacco is one of the most controversial public policy topics at all levels of government. From a regulatory perspective, the principal conundrum is how to regulate a product that is lethal when used as intended, but remains legal for most people over eighteen years of age. As a consequence, tobacco

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control reveals some of the most salient tensions in American political theory: Under what circumstances can government limit individual freedoms to protect citizens from the consequences of their personal and lifestyle choices? What is the relationship between the federal, state, and local governments as the locus of regulatory responsibility for controlling tobacco use? How can conflicting rights and interests (i.e., the right to avoid cigarette smoke vs. the right to smoke) best be resolved? And what role does the concept of civil norms play in discouraging smoking in public places relative to tobacco control laws?

Even today, when smoking in public places is highly regulated in many states, the debate over the scope of that regulation is far from settled. The tension between individual liberties and governmental intervention to protect the public's health is at issue. That the state has the right to regulate smoking to secure the public's health is beyond question. The policy debate is about when, how, and under what circumstances the state should exercise that power (Jacobson, Wasserman, & Raube, 1993).

In this paper we will trace the history of tobacco control at all levels of government, and discuss the various ways in which the debate over tobacco control has been framed. Many other sources can provide a recitation of current federal, state, and local laws and regulations (see, e.g., CDC, 1995; Coalition for Smoking Or Health [CSOH], 1995; CDC, 1995; Americans for Nonsmokers' Rights [ANR], 1996). While we will summarize the current regulatory structure based on those sources, we will also raise the broader questions that animate the continuing debate over tobacco control, and offer some observations about the future role of tobacco control laws and regulations.

Historical Antecedents

Despite a few 17th-century restrictions, significant anti-smoking legislation was not enacted until the second half of the 19th century, primarily in response to the fire hazard created by smoking. Two themes characterized this early legislation: One theme focused on the fire hazard created by smoking (e.g., an 1847 Boston ordinance prohibited smoking on public streets because of the extreme fire danger to wooden structures), while the other concentrated on the morality of smoking. Eventually, opposition to smoking on moral grounds was swept aside by the economic benefits associated with tobacco production and consumption. As the popularity of smoking grew, states realized that cigarette taxes were an important source of revenue, so early anti-smoking legislation was repealed. In fact, by 1927, all state statutes were repealed and the anti-tobacco movement was legally, as well as practically, dead. The political tide did not begin to turn again until the 1960s and lacked momentum until the 1980s.

Arguments in Favor of Regulating Smoking in Public Places

In recent years, the primary argument justifying regulation of tobacco products has been the associated health costs and risks. As noted above, early anti-smoking regulations also contained a moral opposition to tobacco use.

Opposition to smoking on moral grounds. In 1856–57, the British medical journal *Lancet* featured an issue in which fifty doctors expressed their views on "The Great Tobacco Question." Various doctors associated tobacco with increases in crime, nervous paralysis, loss of intellectual capacity, and vision impairment. But the *Lancet* editors argued that, since tobacco was so widespread, it must have some good or at least pleasurable effects. If the evil effects of tobacco were as dreadful as these doctors claimed, the journal's editors concluded that the human race would have ceased to exist (Wagner, 1971; Kluger, 1996).

By the late 1800s, many observers thought cigarettes were corrupt and morally repugnant. For example, in 1884, *The New York Times* warned that smoking could "ruin the republic." Women who smoked were considered promiscuous, and were warned they could become sterile, mustachioed, or tuberculous. In the 1890s, Lucy Page Gaston led a Chicago-based anti-tobacco campaign modeled on the anti-alcohol campaign. Similarly, Henry Ford spoke against smoking, and Thomas Edison refused to hire smokers (Wagner, 1971; Kluger, 1996).

At the beginning of the 20th century, fourteen states had passed laws banning the production, sale, advertisement, or use of cigarettes within their boundaries. For example, in 1897, Tennessee adopted a statute to prohibit the sale of cigarettes. The statute was upheld by the Tennessee and United States Supreme Courts as a valid exercise of a state's police power to protect public health (*Austin v. Tennessee*, 179 U.S. 472 [1900]). In 1901, New Hampshire made it illegal for any person, firm, or corporation to produce, sell, or store for sale, any form of cigarette. A 1907 Illinois law made the manufacture, sale, or gift of a cigarette punishable by a fine of not more than $100 or imprisonment for not more than thirty days. In New York, women were forbidden to smoke in public. Progressive reformers in the early 20th century were particularly concerned about the "demoralizing" effects of tobacco on children, leading to laws prohibiting tobacco sales (primarily cigarettes) to children under the age of eighteen (or twenty-one) in many states (IOM, 1994).

As smoking grew in popularity, the laws were not enforced and, in many instances, were ultimately repealed. By 1909, when the last of these early state laws were passed, national cigarette sales were twice what they had been five years earlier. Cigarette smoking increased dramatically from 1930 on, with the greatest percentage gains during and immediately following World War II. In 1945, 267 billion cigarettes were sold, 12 percent more than in 1944, 48 percent more than in 1940, and 124 percent more than in 1930 (Wagner, 1971).

Opposition to smoking on health grounds. Accompanying this growth in smoking popularity, scientific evidence regarding its ill effects began to be published. In the 1930s, the medical community began to investigate the increase in lung cancer. By the 1940s, scientific reports began to associate smoking with cancer, heart disease, and other adverse health effects. Evidence mounted in the 1950s (Kluger, 1996).

In 1964, the first Surgeon General's Report on Smoking and Health was published. The report concluded that smoking was causally related to lung cancer; that it was the most important cause of chronic bronchitis; that it increased the risk of dying from chronic bronchitis and emphysema; and that it caused coronary disease. Since then, other Surgeons General's Reports have provided additional scientific and quantitative support for these conclusions, and have focused on the particular need to reduce youth access to cigarettes. For example, a recent Surgeon General's Report was devoted entirely to preventing tobacco use among young people (USDHHS, 1994). The focus on teenagers is due, in part, to the fact that about one-half of adult smokers had become regular smokers by age eighteen (CDC, 1993). In a summary of the Surgeon General's Report, Elders, Perry, Eriksen, and Giovino (1994) note that nearly all first use of tobacco occurs prior to high school graduation. Just as troubling, the report noted that the rate of increase in teenage smoking has not declined in the past few years, despite substantial declines in smoking in the population at large. A recent report (CDC, 1994) confirms that smoking among teenagers has actually increased during the past decade, especially among black youths. One policy implication of these reports is that smoking morbidity and mortality can be reduced significantly if teenagers' access to cigarettes is limited (IOM, 1994).

The most recent scientific debate on smoking concerns the effects of passive smoking. In 1990, the Environmental Protection Agency (EPA) released a draft report that reviewed twenty-four epidemiological studies. The EPA concluded that passive smoking causes 3,800 lung cancer deaths each year (EPA, 1992), corroborating an earlier report on passive smoking from the Surgeon General (USDHHS, 1986).

Passive smoking appears to be a particular risk to infants and children. In a study on lung cancer and exposure to tobacco smoke in the household, Janerich and Thompson (1990) concluded that 17 percent of lung cancers among nonsmokers can be attributed to high levels of exposure during childhood and adolescence. Passive smoking has also been found to be a risk-factor for other cancers. For example, a case-control study of women in Utah found that exposure to passive smoking three or more hours a day almost tripled the relative risk of cervical cancer in nonsmokers (Slattery et al., 1989).

Arguments Questioning Smoking Regulations

The above arguments have largely propelled recent regulatory restrictions, but they are not universally accepted as a justification for intervening in the market. For instance, Rabin (1991) argued that current anti-smoking legislative efforts lack a coherent underlying justification, in part because the health risks are primarily borne by the smoker, and in part because the harm threshold for many nonsmokers (such as restaurant patrons) has not been shown to be substantial. Further, Rabin and Sugarman (1993) argue that changing civil norms, rather than regulations, will lead to reductions in smoking in public places. It is important to note that these commentators, while noting certain conceptual limitations in the current regulatory regime, do not oppose smoking regulations.

Other commentators, especially libertarians and those associated with the law and economics movement, argue that the market should determine where and how smoking should be regulated (see, e.g., Tollison & Wagner, 1991; Zycher, 1990). These commentators actively oppose smoking regulations on conceptual grounds as unjustified governmental paternalism. Supporters of the tobacco industry also argue that smokers retain certain rights in pursuing personal social behavior and cannot be discriminated against for their tobacco use (Jacobson, Wasserman, & Raube, 1993).

Much of the opposition to tobacco control laws is for philosophical reasons. A few commentators nonetheless challenge certain aspects of the scientific evidence and regulations based on that evidence. For instance, Gori (1995) challenges the EPA results on passive smoke.

Anti-Smoking Legislation and Regulation

As the scientific evidence of tobacco's harmful effects mounted, legislative activity grew on both the state and federal levels. In states without laws preempting stronger local ordinances, municipalities also have been active in restricting public use of cigarettes.

Federal

Federal activity to regulate smoking has a mixed heritage. Along with providing subsidies for tobacco farmers, Congress has limited federal regulatory oversight and has been largely stymied in restricting smoking by tobacco industry lobbying pressure. At the same time, the emergence of the Surgeon General as a moral and scientific spokesperson against smoking has added a significant federal voice to smoking reduction efforts.

In response to the 1964 Surgeon General's Report on Smoking, Congress enacted the Cigarette Labeling and Advertising Act in 1965, which required health warnings on all cigarette packages. The act superseded proposed Federal Trade

Commission (FTC) rules requiring that manufacturers disclose on all packaging and advertisements that "cigarette smoking is dangerous to health" and "may cause death from cancer and other diseases." Instead, the act mandated the following warning on cigarette packaging: "Caution: Cigarette smoking may be hazardous to your health." Equally important, the Act preempted states from imposing more stringent health warning requirements and prohibited federal agencies from requiring more stringent health warnings.

In 1967, the Federal Communications Commission (FCC) ruled that the "fairness doctrine" applied to cigarette commercials. As a result, all broadcasters who carried cigarette advertising were required to provide equal time to warn the public about cigarettes. In 1968, 1300 anti-smoking messages were aired by the three major networks (Lewit, Coate, & Grossman, 1981). A year later, Congress passed the Public Health Cigarette Smoking Act of 1969, banning all cigarette advertising from television and radio, eliminating the need for broadcasters to provide equal time for anti-smoking messages. The ban was enacted with the acquiescence of the tobacco industry, which was beginning to be affected adversely by the anti-smoking advertisements, and feared greater regulatory activity (Kagan & Vogel, 1993). The Act also amended the health warning on cigarettes to: "Warning: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health." Additionally, Congress restricted the FTC from requiring manufacturers to include health warnings in print advertising, and barred states from imposing "any requirement or prohibition based on smoking and health" on advertising and promotion of cigarettes packaged with labels conforming to the statute.

In 1972, the FTC and cigarette manufacturers agreed upon consent orders requiring all cigarette advertising to display the same warning required for cigarette packaging. Subsequently, the Comprehensive Smoking Education Act of 1984 (CSEA), required four rotating health warnings on all cigarette packages and advertisements. More recently, the Comprehensive Smokeless Tobacco Health Education Act of 1986 required three rotating health warnings for all smokeless tobacco product packaging and advertising. In 1989, Congress voted to ban smoking on airline flights of less than two hours (later extended to flights under six hours).

In recent years, Congress has become more active in legislating tobacco controls where children are involved. Perhaps most significantly, the federal government enacted the 1992 Alcohol, Drug Abuse and Mental Health Agency Reorganization Act requiring states to enact and enforce laws against the sale and distribution of tobacco products to individuals under eighteen years of age. Known as the Synar Amendment (42 U.S.C. 300x-26), the law conditions Alcohol, Drug Abuse, and Mental Health block grant allocations to the states on compliance with these provisions. If a state fails to enact or enforce such laws, its block grant allocations can be reduced by 10 percent in the first year, and by up to 40 percent by the fourth year of noncompliance. The Synar Amendment took effect for all states in 1995. Congress also enacted the Pro Children Act of 1994,

prohibiting smoking in indoor facilities that are routinely used for the delivery of certain services to children, including schools, libraries, day care, health care, and early childhood development centers.

However, the tobacco industry continues to be a strong opponent, particularly on the federal regulatory level. To a large extent, the tobacco industry has successfully limited the extent of federal regulatory oversight. As Kluger (1996, p. 740) observes, it has been a ". . . long-standing travesty that [has] allowed society's most dangerous consumer product to escape serious regulation." For example, the agency most likely to oversee tobacco products, the Food and Drug Administration (FDA), was effectively limited in 1938 by Congressional language that failed to define tobacco as a food or drug that should be regulated (Kluger, 1996).

Since the 1960s, few federal agencies have attempted to promulgate tobacco use restrictions because of expected opposition from Congress or outright Congressional prohibition of regulatory authority. Cigarettes have been specifically exempted from coverage under the Fair Labeling and Packaging Act of 1966, the Controlled Substances Act of 1970, the Consumer Product Safety Act of 1972 (establishing the Consumer Product Safety Commission), and the Toxic Substances Act of 1976. Other nonexempted regulatory agencies, including the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA), have considered, but abandoned, efforts to regulate smoking. EPA has determined that environmental tobacco smoke should be treated as a dangerous carcinogen, but has yet to promulgate regulations that would implement this finding. Likewise, OSHA has proposed standards for regulating indoor air at private worksites, including restrictions on smoking, also without being able to implement the regulations.

In 1995, the FDA announced a series of regulations aimed at restricting youth access to tobacco. The proposed FDA rule, in outline, would: ban cigarette sales in vending machines; ban tobacco billboard advertisements within 1000 feet of schools or playgrounds; restrict ads in publications with more than 15 percent youth readership to black and white, text-only format; require the tobacco industry to fund a $150-million-per-year anti-smoking media campaign; ban brand-name sponsorship of sporting events and concerts; and permit the FDA to regulate tobacco products. Absent a shift in Congressional sentiment or reaching a "grand bargain" with the tobacco industry (Kluger, 1996), there is little likelihood that the regulations will be implemented as proposed.

Despite the relative absence of federal regulation of tobacco products, the importance of the Surgeon General's reports on tobacco cannot be understated as a contributing factor in the emergence of a policy environment receptive to various tobacco control strategies (Jacobson, Wasserman, & Raube, 1993; Kagan & Vogel, 1993). As Kagan and Vogel (1993) point out, the authority of the Surgeon General's office and the meticulous accumulation of the scientific evidence have allowed the various Surgeons General to "advocate interventionist governmental policies." In particular, the 1986 Surgeon General's Report on the dangers of environmental

tobacco smoke undermined libertarian arguments that anti-smoking laws were unnecessary to protect third parties from tobacco's harms, and facilitated the expansion of state and local anti-smoking laws (Jacobson, Wasserman, & Raube, 1993; Kagan & Skolnick, 1993).

State Involvement

Trends. Four trends capture state legislative developments since 1989: (1) the expansion of the number of states enacting some smoking restrictions; (2) a legislative focus on enacting laws to restrict access to teenagers, including vending machine and point-of-sale restrictions; (3) the enactment of some form of nondiscrimination against smokers (thirty states between 1989 and 1995, according to CSOH, 1995); and, (4) the continued enactment of state laws preempting stronger local ordinances (twenty-seven states according to CSOH, 1995; seventeen according to CDC, 1995). Taken at face value, these trends appear to be somewhat contradictory. In all likelihood, the legislative results represent the shifting balance between the tobacco industry and tobacco control proponents as various arguments, i.e., science versus individual freedoms, gain in the legislative debate. The trends also reflect the trade-offs demanded as the price of legislation. For example, the only way to enact statewide Clean Indoor Air Act restrictions in Florida and Illinois was to accede to preemption (Jacobson, Wasserman, & Raube, 1993).

The legislative debates. Most of the state legislative debates from the late 1970s through the mid- to late 1980s centered on the sufficiency of the scientific evidence to justify legislative intervention. When the debate was on the scientific evidence, the tobacco industry was on the defensive. Beginning in the mid- to late 1980s, there appeared to be a shift in the nature of the debate—away from science and toward consideration of personal freedoms issues—largely resulting from the tobacco industry's strategy to emphasize individual rights (Jacobson, Wasserman, & Raube, 1993). This strategy met with some success, particularly in generating legislation to protect smokers from discrimination in employment, such as that enacted in Illinois, but was generally not sufficient to overcome the weight of the scientific evidence.

In the early- to mid-1990s, the terms of the debate shifted once again, this time toward a focus on children. For many anti-smoking advocates, the focus on children was likely to become an effective strategy because of its general political attractiveness to legislators and because it is difficult for the tobacco industry to publicly oppose restrictions on youth access. So far, largely to comply with the federal Synar Amendment, all states have enacted youth access restrictions. Even so, one prominent anti-smoking activist recently objected to the youth access strategy as derogating from a more comprehensive attack on smoking (Glantz, 1996).

Restricting smoking in public places. For the most part, statutes limiting smoking in public places were relatively rare prior to 1970. At that time, only fourteen states[1] had laws that limited smoking. In 1977, 392 smoking control bills were introduced in the various state legislatures, and twenty-eight states enacted forty-four bills into law (Christoffel & Stein, 1979). Although most of these bills involved matters such as taxation of cigarettes or control of transport, a considerable number sought to limit cigarette smoking in one way or another.

Today, forty-nine states restrict smoking in some manner in public places. These laws range from nominal restrictions, such as public buildings and schools in Indiana and Kentucky, to very extensive restrictions, such as prohibitions on smoking in many public places in Utah and Vermont. Only a few states have enacted comprehensive clean indoor air laws that restrict or prohibit smoking in a wide variety of public places. In addition, forty-three states restrict smoking at public worksites, and twenty-three states restrict smoking in private worksites (CSOH, 1995). In Table 1, we combine 1995 published data from the Centers for Disease Control and the Coalition on Smoking Or Health to show state laws on several dimensions: clean indoor air restrictions at government worksites, private worksites, and restaurants; youth access restrictions on vending machines and vendor licensing; advertising restrictions; and preemption and nondiscrimination provisions.

Two items stand out from Table 1. First, the sheer volume of tobacco control legislation suggests that tobacco remains a subject that legislators are willing to confront. Second, the tobacco industry has had considerable success at the state level in enacting legislation that preempts more stringent local ordinances and prohibits discrimination against smokers, especially in employment. As many as twenty-seven states have some form of preemptive legislation, often prohibiting stronger local ordinances than the provisions of state law (CSOH, 1995). As part of Washington State's Synar Act, for example, the tobacco industry was able to include a provision that preempts local licensure or regulating tobacco sales in retail stores. Except for legislation in a few states, such as Minnesota, the tobacco industry has also been successful in preventing stringent Clean Indoor Air Act restrictions and in diluting enforcement authority.

Youth access restrictions. As of 1993, forty-seven states had enacted laws that prohibited the sale of tobacco products to persons under eighteen years of age (Bierig, Weber, & Scarborough, 1994). By 1995, all states had restricted minors' access to tobacco products in one form or another. But as the IOM (1994) report on preventing nicotine addiction in children points out, these laws have gone largely unenforced since their enactment in the early part of the 20th century. "Despite increased national interest in curtailing underage smoking, minors still have virtu-

[1]For convenience, we include the District of Columbia as a state.

Table 1. Summary of State Laws by Type of Restriction and State

State	Smoke-Free Indoor Air			Youth Access to Tobacco Products			Preemption		Non-Discrimination
	Gov't worksites	Private worksites	Restaurants	Vending machine restrictions	Licensing	Advertising of tobacco products	CSOH	CDC	
Alabama					X				
Alaska	X	(a)	X	X	X				
Arizona	X								X
Arkansas	(a)			X	X				
California	X	X	X	(a)		X	X	X	
Colorado	X			X					X
Connecticut	X	X	X	X	X		X	X	X
Delaware	X	X	X		X		X	X	
Florida	X	X	X	X	X		X	X	
Georgia				X	X				
Hawaii	X		X	X					
Idaho	X		X	X					
Ilinois	X	X	X	(a)		X	X	X	X
Indiana	X			X					X
Iowa	X	X	X	X	X		X	X	
Kansas	X		X		X				
Kentucky	(a)			X	X	X	X	X	X
Louisiana	X(b)	X(b)		X(b)	X	X	X	X	X
Maine	X	X	X	X			X		X
Maryland	(a)	(a)	X	X	X				
Massachusetts	X		X	X	X		X		
Michigan	X		X	X	X	X	X	X	
Minnesota	X	X	X	X					X
Mississippi				X			X		X

Missouri	X	X	X	X					X
Montana	X	X	X	X	X		X		X
Nebraska	X(b)	X	X	X	X				
Nevada	X		X	X	X		X	X	X
New Hampshire	X	X	X	(a)	X				X
New Jersey	X	X		X	X		X		X
New Mexico	X			X			X		X
New York	X	X	X	X	X		X		X
North Carolina	(a)				X		X	X	X
North Dakota	X		X		X				X
Ohio	X			X	X				
Oklahoma	X		X	X	X		X	X	X
Oregon	X		X	X			X		X
Pennsylvania	X	X	X		X	X	X	X	
Rhode Island	X	X	X	(a)	X				X
South Carolina	X				X			X	X
South Dakota	X			X			X		X
Tennessee				X			X	X	X
Texas					X	X			
Utah	X	X	X	X	X	X	X	X	
Vermont	X	X	X	X	X				
Virginia	X		X	X(b)			X	X	X
Washington	X	(a)	X	X	X		X		
Washington, DC	X	X	X	X	X				X
West Virginia						X			X
Wisconsin	X	X	X	X	X		X		X
Wyoming	X			X					X
Total									

Sources: Centers for Disease Control 1995; Coalition on Smoking Or Health, 1995.
(a) = CSOH, not CDC
(b) = CD not CSOH

ally unimpeded access to tobacco products." (IOM, 1994, p. 201.) Indeed, it was not until the late 1980s that public attention to youth access restrictions became an integral part of the policy agenda. Since then, local communities have shown a greater willingness to enact and enforce ordinances limiting minors' access to cigarettes.

Local Involvement

At the local level, the number of ordinances restricting smoking has also increased. In 1985, approximately ninety local communities restricted smoking in public places (CDC, 1989). By 1993, over 500 counties or cities had enacted anti-smoking ordinances (Coalition on Smoking Or Health, 1993; see also Rigotti & Pashos, 1991). Currently, 782 communities have enacted clean indoor air ordinances, 281 have enacted youth access ordinances, and 273 have enacted both (ANR, 1996). Further growth in local ordinances restricting smoking behavior is limited by statewide laws that preempt local ordinances and protect smokers' rights against discrimination for smoking behavior.

Despite these restrictions, a growing number of local anti-smoking laws have targeted teenagers. For example, according to the Surgeon General's Report on preventing tobacco use among young people, at least thirty cities in Minnesota, New York, California, Maryland, New Jersey, and Louisiana have outlawed the use of cigarette vending machines. Moreover, many other cities have adopted laws that limit teenage access to cigarette vending machines by requiring that such machines be placed in view of an employee, restricting the use of the machines to certain types of businesses and/or private facilities, or requiring the use of locking devices on the machines (USDHHS, 1994; IOM, 1994).

For a variety of reasons, including more stringent regulation of vending machines, minors now purchase most cigarettes at convenience stores and gas stations. Thus, local ordinances permitting license removal from vendors who sell cigarettes to minors is a more powerful law than laws requiring cigarettes to be sold from behind the counter.

In addition to federal advertising regulations, several localities have restricted advertising for tobacco products. For example, Boston and San Francisco each have banned tobacco advertising in their mass transit systems (Bierig, Weber, & Scarborough, 1994). In 1994, Baltimore banned publicly visible cigarette and alcohol billboards, with some minor exceptions (Garner, 1996). Cincinnati has also prohibited cigarette advertisements near schools, playgrounds, and parks. As Garner (1996) recounts, Baltimore's ad ban was upheld by the Fourth Circuit Court of Appeals, *Penn Advertising of Baltimore, Inc. v. Mayor of Baltimore*, 63 F.3d 1318 (4th Cir., 1995). The ban was reaffirmed in *Anheuser-Busch v. Schmoke*, #94-143 (4th Cir., 1996), despite a recent U.S. Supreme Court case overturning restrictions on alcohol advertising based on First Amendment commercial speech freedoms.

Judicial Involvement

Until recently, courts have played a decidedly secondary role in regulating tobacco products, generally permitting states and localities wide-ranging authority to regulate tobacco products. The courts' reluctance to overturn laws regulating smoking was succinctly summarized by the U.S. Supreme Court in *Austin v. Tennessee*, 179 U.S. 343 (1900) in holding that the regulation of cigarette sales was within the powers of the states:

"Without undertaking to affirm or deny their evil effects, we think it within the province of the legislature to say how far [cigarettes] may be sold or to prohibit their sale entirely . . . and there is no reason to doubt that the act in question is designed for the protection of the public health." (179 U.S. 348–349.)

As a result, there actually have been only a few challenges to state or local tobacco control laws. On the other hand, juries have been reluctant to hold cigarette manufacturers responsible for the free choices an adult smoker makes, and courts have not imposed strict liability on the manufacturers, thus limiting the incidence of litigation (see, e.g., Schwartz, 1993). The tobacco industry's defense that the smoker assumes the risk has meant that ". . . tort liability has contributed virtually nothing to the array of strategies employed to control tobacco use" (Rabin, 1991, p. 494).[2] Recently, however, a jury in *Carter v. Brown & Williamson Tobacco Corp.* (Florida, August 1996) ruled in favor of a plaintiff who had started smoking before warnings were required on packs of cigarettes. Whether this is a harbinger of future verdicts remains to be determined, but it at least suggests that the tobacco industry may not be invulnerable to legal challenges regarding the dangerousness of its products and to challenges about its veracity.

It seems unlikely that courts will intervene to block tobacco control regulations. Indeed, the Florida Supreme Court recently upheld a local ordinance that required applicants for public employment in North Miami to refrain from smoking for one year prior to their application (*City of North Miami v. Kurtz*, 1995 Lexis 568, [Florida, 1995]). Likewise, courts have upheld total bans on vending machines as a means of restricting youth access to cigarettes (Bierig, Weber, & Scarborough, 1994).

With the emergence of class-action litigation challenging nicotine addiction and the smoking-related costs of Medicaid coverage, courts may yet become an important forum for regulating tobacco products by imposing damages for resulting harms (see Kelder et al., this issue). Nevertheless, while promising as a means of protecting many regulatory provisions, reliance on a judicial strategy to go beyond what the regulators or legislators are willing to enact has inherent limitations. Recently, for instance, a major class-action lawsuit against tobacco manufacturers was thrown out by the Fifth Circuit Court of Appeals. Other challenges await a

[2]As many have noted, there is a certain irony in the way that the health warnings from the 1960s, enacted over tobacco industry opposition, have virtually insulated the industry from tort liability.

much-publicized strategy of states suing tobacco firms for recovery of Medicaid health care costs. Showing net economic harm from cigarettes, given savings in entitlements from earlier death, may be difficult. Nevertheless, the recent verdict noted above may indicate that the industry is starting to be held to higher standards of disclosure on the hazards of smoking. Thus, the legal situation is fluid, and it remains to be seen whether courts will act as a regulatory constraint on tobacco sales and consumption.

Studies of Effectiveness and Implementation

Accompanying the increase in state and local tobacco control legislation and regulation, researchers have attempted to study empirically how effective these various approaches are for reducing both smoking in public places and youth smoking initiation rates. These results are important for understanding what works and for understanding the gaps in legislation that need to be addressed.

An important gap in the literature is the availability of an accurate measure of regulatory stringency. At present, it is very difficult to compare the effectiveness of state legislative provisions across jurisdictions (that is, to determine which laws work best). Current indices of regulatory stringency, including Wasserman et al., (1991) and Warner (1981), essentially assign numeric values to particular regulatory provisions, and total the resulting figures to arrive at a set of index values, often using a range of Minimal, Moderate, Extensive, and Comprehensive (see, e.g., CSOH, 1995). Absent certain adjustments, these indices can be misleading. A stringency index must also take into account: whether state law preempts local ordinances; the level of enforcement authority contained in the legislation; the locus of enforcement authority (state v. local); the existence of smokers' rights provisions; whether smoking is prohibited in certain locations or only restricted; whether private worksites are covered; and which party has the burden of showing that smoking is permitted or prohibited.

Effectiveness of Regulations Limiting Smoking Behavior

The literature on the effectiveness of clean indoor air restrictions demonstrates the inherent conundrum underlying these laws. To be effective, some continuing enforcement presence is needed, but most clean indoor air laws lack a strong enforcement component and are perceived to be self-enforcing. If, in fact, they are not self-enforcing, the laws are unlikely to be particularly effective.

For example, Rigotti et al. (1988), Rigotti et al. (1992), Rigotti et al. (1993), and Rigotti, Stoto, and Schelling (1994) have conducted a significant amount of research regarding the compliance of businesses with anti-smoking laws, in particular the self-enforcement approach. Results from these studies, conducted in Cambridge, Massachusetts, indicate that awareness of the local no-smoking ordi-

nance in workplaces declined from 92 percent to 73 percent over the two years after passage. Eighty percent of companies surveyed restricted smoking three and twenty-four months after passage, but only half the businesses fully complied with the law at either date. Based on this work, Rigotti, Stoto, and Schelling (1994) conclude that business size is important in determining compliance, with small businesses less likely to rely on self-enforcement; that the anti-smoking laws led to a high level of smoking restrictions; and that reminders to business are needed to avoid erosion in compliance over time.[3]

Effectiveness of Regulations Restricting Minors' Access to Tobacco Products

Several studies have shown how easily minors can purchase cigarettes (see, e.g., DiFranza & Brown, 1992; Radecki & Zdunich, 1993; and DiFranza, Savageau, & Aisquith, 1996). Other studies have demonstrated that merchant education has failed to produce sustained refusal to sell cigarettes to minors (Feighery, Altman, & Shaffer, 1991). The literature on enforcement of youth access restrictions is less extensive, but demonstrates generally the ability and need to enforce these laws. Unlike the Clean Indoor Air Act restrictions, youth access restrictions are not susceptible to self-enforcement.

For example, Feighery, Altman, and Shaffer (1991) examined the effects of combined community education and enforcement efforts in four Northern California communities. They found that the combined enforcement and education approach resulted in reduced tobacco sales to minors, but that education efforts alone had only a limited effect. Similarly et al. (1991) examined the enforcement of laws against selling cigarettes to minors. They found that aggressive enforcement and follow-up compliance checks led to 96 percent compliance by cigarette vendors against sales to minors, and a substantial reduction (50 percent) in tobacco use among local junior high school students.

As a follow-up to the 1991 study, Jason et al. (1996) studied the accessibility of cigarettes to "older" minors. The ability of minors aged fifteen through seventeen to purchase cigarettes from merchants in Woodridge, Illinois, was compared with the same ability of minors aged thirteen and fourteen. The results from sixteen compliance checks revealed that sales rates to the thirteen- and fourteen-year-olds was below 13 percent. Sales rates to the fifteen- and sixteen-year-olds were below 20 percent, while sales rates to the seventeen-year-olds were 25 percent. Based on these results, the authors suggest that interventions designed to restrict minors' access to cigarettes must address the differing abilities of minors of differing ages to purchase cigarettes.

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[3]For similar conclusions in other settings and areas, see Nordstrom and DeStefano, 1995; Patten et al., 1995; and Brownson et al., 1995.

Discussion

Taken together, the current state of regulatory, judicial, and legislative pressure on the tobacco industry presents a concentrated, perhaps unprecedented, assault on a legal product. Along with continuing educational efforts, the current activity represents a comprehensive approach to tobacco control. Two questions, however, remain unanswered. First, in view of the recent increase in smoking rates, how effective are regulations restricting smoking? The fact remains that a certain portion of the population, perhaps as much as 20 percent, remains impervious to efforts to reduce smoking. And second, what are the consequences if the tobacco industry emerges relatively unscathed, and hence deadlier than ever, from this regulatory assault? In short, it is timely to ask where anti-smoking advocates go from here.

The first issue is to determine where and how to allocate anti-smoking resources. As Rabin and Sugarman (1993) note, there is an undetermined relationship between cultural change and the enactment of laws and regulations. To the extent that cultural norms lead to reductions in tobacco use, continued pressure for additional restrictions may be counterproductive by stimulating a backlash against governmental or paternalistic policies. But, to the extent that laws and regulations stimulate or validate changing cultural norms, it is important not to abandon the force of law in maintaining the desired goal of reduced tobacco use. The issues Rabin and Sugarman raise are whether gains from additional restrictions are worth the costs, and whether the rights-based approach is the most effective way to resolve the underlying conflicts between smokers and nonsmokers.

While recognizing the potential costs of seeking additional regulations, as well as the unanswered question of how effective the laws and regulations are in reducing tobacco use, we strongly believe that abandoning the effort to obtain additional laws would be a mistake. In all likelihood, changes in civil norms facilitate the enactment of legislation which, in turn, codifies civil norms. Given their symbolic authority, laws serve to institutionalize nascent civil norms (Kagan & Skolnick, 1993). Legislation therefore acts to express the government's public policy concern that tobacco use is dangerous to health, contributes to a social climate that discourages smoking in public places, and legitimizes attempts to bring additional public pressure to reduce cigarette consumption. Tobacco control legislation also shifts control from the smoker to the nonsmoker and places the burden of showing that smoking is permitted on the smoker. These provisions are important because most people obey the law voluntarily. Just as civil norms, absent legislative support, may not last, legislation alone, absent evolving social norms that render tobacco control laws more effective, will not achieve the goals of reducing cigarette consumption, a lesson learned in the early 1900s. Indeed, previous research demonstrates that nonsmokers will not ask smokers to refrain from smoking, unless such reinforcing support is present and clear (Gibson & Werner, 1992, 1994).

Thus, it would be a mistake for anti-smoking advocates to abandon a legislative strategy. Instead, advocates need to clarify the rationale for additional legislation and regulations, specify the areas where laws are needed, and participate in implementing these laws. Public policy should be designed to discourage smoking in public places and prevent cigarette sales to minors. Legislation restricting those activities is the strongest message the government can send to protect the public's health.

A subsidiary question for anti-smoking advocates is whether to concentrate their resources at the state or local level. As previous studies have shown, the tobacco industry is considerably more powerful at the state than at the local level (Jacobson, Wasserman, & Raube, 1993; Samuels & Glantz, 1991; Samuels et al., 1992). While the political dynamic will differ across states, it is important for tobacco control advocates to recognize that they can be more effective at the local level. They also face the danger of having their resources exhausted by contesting the tobacco industry at the state level.

One of the unresolved issues in the literature is the extent to which the vagueness of most statewide anti-smoking legislation and concomitant limitations in enforcement authority render clean indoor air act restrictions more of a symbolic statement of the desire to control smoking than an easily enforceable mandate. An issue that is often ignored in legislative battles is the locus of responsibility for enforcing and implementing tobacco control legislation. Relatively few studies have addressed directly the question of how laws restricting smoking in public places and youth access restrictions are implemented and enforced (Burns et al., 1992).[4]

Several other directions seem promising, based on preliminary empirical findings, and should be pursued. First, the California anti-smoking advertisements, funded by Proposition 99 funds, have been successful (see Siegel & Biener, this issue) and should be replicated in other states. Research by Pierce and others (Pierce, Lee, & Gilpin, 1994; Evans et al., 1995; DiFranza & Asquith, 1995) shows that the tobacco industry's advertisements have a powerful effect on youth. Fashioning an equally devastating portrait of the harms from tobacco should remain an anti-smoking imperative.

Second, despite Glantz's (1996) concerns that the focus on youth access restrictions will impede a more comprehensive anti-smoking effort, the fact remains that few people choose to initiate smoking in their twenties or beyond. If so, it makes sense to concentrate resources on school-based and other youth programs to determine what additional approaches would be effective in reducing smoking initiation rates (Brownson et al., 1995; Hine et al., this issue). We now know, for example, that until recently, smoking initiation rates for black youths were far less than for white youths. According to CDC that trend has been reversed. What can we

[4]The authors are currently conducting a Robert Wood Johnson Foundation–funded study of tobacco control enforcement and implementation in seven states.

learn about why rates for black youths have fluctuated so rapidly? How can those lessons be extrapolated to other groups?

Third, as our current work will demonstrate (Jacobson & Wasserman, 1996), state and local efforts to enforce anti-smoking laws (both clean indoor air and youth access restrictions) are woefully inadequate. Anti-Smoking advocates and coalitions need to pay more attention to the admittedly less scintillating tedium of enforcement. For example, coalitions might focus part of their legislative activities on strengthening enforcement provisions, including local licensure removal and suspension authority.

Conclusions

No matter how successful the anti-smoking campaign has been in recent years in generating legislative and regulatory scrutiny, in changing civil norms that have led to generally lower cigarette consumption, and in putting the tobacco industry on the defensive, at least regarding youth access to tobacco, the tobacco industry remains a strong, creative, and relentless opponent. In a democracy, the relationship between the right of the government to protect the public's health constantly collides with the equally powerful right of the individual to determine how to live his or her own life, free from governmental interference. Striking the proper balance is never easy, particularly when the economic survival of politically powerful interests is at stake. Absent a consistent, comprehensive, and committed effort from antismoking advocates, legislators and regulators are likely to subordinate public health interests to the tobacco industry's narrow economic claims.

This historical overview suggests how far anti-smoking advocates have come in reducing the public's exposure to cigarette smoke and the harms from tobacco. It also suggests how much more needs to be done to limit those health risks and harms. In our view, the anti-smoking gains over the past two decades have been substantial. But they are also fragile and not irreversible, subject to the tobacco industry's creative abilities to re-glorify smoking.

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Smoker-Nonsmoker Conflict: Using a Social Psychological Framework to Understand a Current Social Controversy

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Over the past two decades, state and federal restrictions of public smoking have become increasingly common. The resulting controversy has generally focused on the research evidence regarding the physiological effects of second-hand smoke while ignoring relevant psychological aspects of smoker-nonsmoker conflict. In this article I review the literature on the psychological consequences of smoker-nonsmoker interaction, interpreting these results from the framework of social psychological research on inter-group conflict. From this review I conclude that: a) smoker-nonsmoker conflict shares many characteristics of other ingroup-outgroup interactions; b) both groups are served by the legislated separation of these groups; and c) such separation can be successfully accomplished only when close attention is paid to subtle environmental cues. Finally, theoretical benefits of studying smoker-nonsmoker conflict from a social psychological perspective are discussed.

One of the most acrimonious public policy debates of the past twenty years has been that between smokers and nonsmokers over the legislated restriction of public smoking. The nation's first Clean Indoor Air Act was passed by Minnesota in 1975, and since then forty-four states and the District of Columbia have all restricted public smoking to some degree (Jacobson, Wasserman, & Raube, 1992). Other restrictions have been established for domestic commercial airline flights, government buildings, and numerous private businesses. The reasoning behind these restrictions has always been the health threat posed by environmental tobacco smoke (ETS, See U.S. Department of Health and Human Services, 1986 for a review). Similarly, the

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tobacco industry's defense against the restrictions has been to question the validity of the research suggesting that ETS is indeed harmful (see Tollison, 1988, for a review). What both sides of the debate have failed to consider are the social psychological underpinnings of smoker-nonsmoker interaction in both the workplace and in public settings. A large number of studies have examined various responses of nonsmokers when placed near a smoker (see Gibson, 1994, for a review), but few have looked to social psychological research and theory to help understand the dynamics of these interactions. Social psychological research in areas as diverse as task performance, person perception, stereotyping, aggression, altruism, interpersonal distance, and intergroup relations has a direct bearing on the question of whether such restrictions should be established, and if so, how they should be enacted. In addition, social psychological theory may benefit by examining the unique structural qualities of smoker-nonsmoker conflict and comparing this type of inter-group conflict with other research addressing majority-minority interaction.

In the following section I review research on task performance that has particular relevance to workplace smoking restrictions. Next, I consider research on intergroup judgments, stereotyping, aggression, helping, and interpersonal distance, that has implications for smoker-nonsmoker interactions in public settings. I conclude by examining research addressing the attempted separation of smokers and nonsmokers in public spaces and the variables found to be important in successfully separating smokers and nonsmokers.

Task Performance

Of main concern to employers when determining workplace policy are questions of performance. A wide variety of social and environmental stressors have been found to decrease at least some types of task performance. Density (Paulus et al., 1976), noise (Glass & Singer, 1972), and air pollution (Putz, 1979) have all been shown to diminish task performance under some conditions. These results suggest that nonsmokers' task performance may also be adversely affected by exposure to a smoke-filled environment. In fact, research indicates consistent performance decrements when nonsmokers are forced to be near smokers and second-hand smoke.

An early study in this area compared test scores of students who were either separated into smoking-permitted and no-smoking rooms, with those who were placed in a single room in which the smokers were allowed to smoke (Kidd, 1973). Results indicated that performance in the segregated environments was significantly better for both nonsmokers and smokers. Kidd suggested that smokers' performance may suffer in uncontrolled environments due to concern regarding their smoking behavior. Other research has demonstrated similar performance decrements for nonsmokers when forced to be near smokers (Beh, 1989; Gibson & Werner, 1992; Oborne, 1983).

Workplace Restrictions

A 1990 survey of 608 corporations found that 25 percent currently had workplace smoking policies in place, and another 35 percent were interested in developing such policies (Jason & Lonak, 1990). These policies may range from a limited ban on smoking in sections of the employee cafeteria to a total worksite smoking ban. A large body of research addresses the viability of such programs. However, beyond the simple provision of clean air for their nonsmoking employees, many companies that implement no-smoking policies have the additional goal of improving employee health by reducing the overall prevalence of smoking in their workforce. Thus, the main dependent variable in much of the research in this area is how many employees quit smoking after implementation of the workplace policy (see Fielding, 1991, for a review). It is therefore difficult to ascertain the success of such programs in regard to the more basic goal of improving workforce performance. When possible, future research addressing the utility of restrictions on workplace smoking should address the question of worker performance.

Though it may be an important variable in considering workplace smoking restrictions, task performance is not the only variable to be affected when smokers and nonsmokers interact. The interaction of smokers and nonsmokers in public areas is frequently marked by conflict, and it is in these areas that most legislative efforts are intended to have their greatest effect. Therefore these areas are more relevant to the issue of general public policy related to smoking. In public areas the interactions between smokers and nonsmokers is likely to be colored by the perception of outgroup members, the emotional responses to these outgroup members, and subsequent changes in behavior toward outgroup members.

Intergroup Judgments

Experiential evidence would suggest that smokers and nonsmokers perceive each other negatively (cf., Farley, 1994; Gibbs, 1988). Social psychological research on intergroup perception would seem to have relevance to this process. For example, many studies have identified ways in which outgroup members are perceived more negatively than ingroup members (cf. Doise et al., 1972; Rabbie & Horowitz, 1969). In addition, memory for ingroup and outgroup behaviors may be biased toward the ingroup. Howard and Rothbart (1980) found that we tend to remember more negative information about outgroup members and more positive information about ingroup members. Furthermore, in what has been termed the ultimate attribution error (Pettigrew, 1979), dispositional attributions about negative events are more likely to be made if those negative events were perpetrated by an outgroup member (see Hewstone, 1990 for a review). Finally, the mere association of nonsense syllables with outgroup pronouns (e.g., them, they, etc.) was enough to produce negative evaluation of the nonsense syllables (Perdue et al,

1990). Similarly, when ingroup pronouns were flashed prior to the presentation of positive words, subjects responded more quickly, suggesting that ingroup pronouns can serve as semantic primes for positive constructs (Perdue et al., 1990). This literature suggests that if nonsmokers classify smokers as members of an outgroup, their judgments of smokers' actions may be more negative than their judgments of nonsmokers.

A number of studies have provided strong empirical support for the operation of these ingroup-outgroup biases in nonsmokers' perceptions of smokers. These studies have identified an impressive array of personal characteristics on which nonsmokers perceive smokers less favorably than they perceive other nonsmokers.[1] Among the traits on which nonsmokers rate smokers less favorably are intelligence or wisdom (Cooper & Kohn, 1989; Dermer & Jacobsen, 1986; Polivy, Hackett, & Bycio, 1979), likability (Bleda & Sandman, 1977; Clark, Klesges, & Neimeyer, 1992), morality (Clark et al., 1992), health (Clark et al., 1992; Cooper & Kohn, 1989; Dermer & Jacobsen, 1986; Echabe, Guede, & Castro, 1990; Goldstein, 1991; Lee, 1989), consideration (Dermer & Jacobsen, 1986; Goldstein, 1991), sophistication (Cooper & Kohn, 1989), self-discipline (Cooper & Kohn, 1989; Dermer & Jacobsen, 1986), insecurity, hyperactivity, and nervousness (Echabe et al., 1990), and degree of calmness, honesty, imagination, maturity, and manners (Dermer & Jacobsen, 1986). In addition to these internal qualities, nonsmokers also consider smokers to be less attractive (Bleda & Sandman, 1977; Clark et al., 1992; Goldstein, 1991; Polivy et al., 1979), less desirable dating or marriage partners (Goldstein, 1991; Malouff, Schutte, & Kenyon, 1991), less desirable close friends (Goldstein, 1991), less desirable employees or coworkers (Bleda & Sandman, 1977; Goldstein, 1991; Lee, Malouff, & Schutte, 1990); worse students (Cooper & Kohn, 1989), and more sexually active (Clark et al., 1992). Furthermore, nonsmokers' attributions for the actions of smokers are more unfavorable than the attributions made regarding the actions of other nonsmokers (Gibson, 1996). The nearly universal result is for nonsmokers to view smokers more negatively on any dimension being considered.[2] Further evidence for this idea is provided by recent research in which nonsmokers responded more quickly and confidently with respect to negative information regarding smoking, suggesting that an "anti smoking" schema exists in many nonsmokers (Litz, Payne, & Colletti, 1987).

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[1] Although for the purposes of this article it is more important to consider perceived rather than actual differences, it should be noted that smokers and nonsmokers have been found to vary on some individual difference dimensions including anger-proneness, extroversion, self-control and the Type-A behavior pattern (cf., Cherry & Kiernan, 1978; Geist & Herrmann, 1990; Gilbert, 1988; Seltzer & Oeschsli, 1985).

[2] Some evidence suggests that this trend may not be as prevalent in other cultures. For example, Australian students rated smokers as more successful, sophisticated, sociable, modern, hardworking, and liberated than nonsmokers (Lee, 1989).

The concept of an anti-smoking schema presents the interesting possibility that the treatment of smokers by nonsmokers may be importantly different from the treatment of other stigmatized groups by the majority. Some research has suggested that ingroup/outgroup evaluative differences tend to derive from enhanced ratings of the ingroup rather than derogation of the outgroup (cf., Brewer, 1979; Dovidio & Gaertner, 1993). However, in a number of the studies cited above, smokers are rated not only significantly less favorably than nonsmokers, but significantly lower than the scale midpoint as well. It may be that the current egalitarian norms and resultant social restraint in overt expressions of prejudice (cf., Devine, 1989; Gaertner & Dovidio, 1986) do not apply to the expression of these feelings toward smokers. Troyer and Markle (1983) have suggested a similar idea, noting that cigarette smoking represents an exception to the trend of increased tolerance in our society. In conclusion, negative stereotypes of smokers exist, and current societal norms may not inhibit the expression of those stereotypes.

Nonsmokers' Response to Smokers and Second-hand Smoke

Affective Responses

Research on ingroup-outgroup interactions has found that, beyond the stereotypes of outgroups and our cognitions regarding their behavior, there are often affective consequences of such interactions. Some studies have demonstrated the occurrence of emotional responses to simple ingroup-outgroup categorization processes. Just anticipating interactions with an outgroup member is often enough to arouse anxiety in the ingroup member (Stephan & Stephan, 1985). Furthermore, this negative affect is related to the lowered evaluations of the outgroup member. Jackson and Sullivan (1989) showed that heterosexual subjects felt more negative affect when evaluating a homosexual job applicant than when evaluating a heterosexual applicant and that this difference predicted evaluations of the target. Thus, interacting with a stereotyped outgroup seems to be an emotion-laden experience (cf., Vanman & Miller, 1993).

Evidence that nonsmokers' interactions with smokers is characterized by such affective reactions was provided by Jones (1978), who reported that exposure to second-hand smoke led to increased anxiety, heightened feelings of fatigue, and lowered levels of arousal. Similarly, Bleda and Sandman (1977) found that self-reported hostility was significantly greater for those who had just interacted with a smoker, and that self-reported depression and anxiety were marginally greater in this condition. Zillmann, Baron, and Tamborini (1981) also found that hostility increased when nonsmokers were exposed to second-hand smoke. This increase in hostility toward the experimenter occurred both when the experimenter was the source of the smoke and when an assistant was the source of the smoke. Both Beh (1989) and Gibson and Werner (1992) found a more negative mood when non-

smokers were forced to be near a smoker. Furthermore, Gibson and Werner found no such drop in mood when the nonsmoking subject was simply exposed to cigarette smoke in the absence of any smoker. This suggests that the mood decrements were due to the social interaction with the smoker rather than to mere exposure to second-hand smoke. In conclusion, the results reviewed here suggest that nonsmokers will experience a number of negative affective consequences when interacting with a smoker.

Current theory regarding the relationship between the cognitive and affective components of intergroup interactions would suggest that these two components can have reciprocal influence on one another (cf., Hamilton & Mackie, 1993; Stephan & Stephan, 1993). In terms of smoker-nonsmoker interactions, this view would suggest that a nonsmoker's cognitive appraisal of smokers will have an important influence on his or her interpretations of experienced emotion when near a smoker. Similarly, affect may influence what aspects of such social interactions are attended to, and therefore the cognitions likely to be generated from such interactions. Furthermore, recent research (Jussim et al., 1995) suggests that affect generated from such interactions may be influential in motivating behavioral biases on the part of those holding the stereotype. These behavioral biases are the subject of the next section.

Behavioral Responses

Aggression. Nonsmokers hold negative stereotypes of smokers and feel negative emotions when near smokers. Social psychological research would suggest that there would be associated behavioral responses to these cognitive and affective reactions to smokers. For example, when frustrated, ingroup members are likely to increase aggression against members of a stereotyped outgroup (Weatherly, 1961). However, in line with the previously cited research on the inhibition of overt expressions of prejudice, Rogers and Prentice-Dunn (1981) found that Caucasian subjects gave lower-level shocks to an African-American confederate than to a Caucasian confederate unless the confederate had insulted the subject. When receiving an insult from the confederate, subjects gave significantly stronger shocks to the African-American confederate. Thus, aggression toward the stereotyped group is inhibited unless it is somehow validated through provocation. Given the current lack of social restraints on expressions of prejudice toward smokers (cf., Troyer & Markle, 1983), we might expect that nonsmokers' aggression toward smokers would not be inhibited when provocation from the smoker was lacking. Nonsmoker aggression has been found to increase when subjects were exposed to second-hand smoke while delivering their aggressive response to a confederate (Jones & Bogat, 1978). However, in this research the target of the aggression was not the source of the smoke, so it is impossible to determine from these data if willingness to aggress is unimpeded by social restraint. Research in other areas of social

interaction between ingroups and outgroups would suggest further negative consequences for smokers. One area in which we might expect behavioral outcomes is in the domain of helping behavior.

Helping behavior. Altruistic acts are more likely to occur when we are similar to and like the potential target of our altruism and when that person is a member of our ingroup (Emswiller, Deaux, & Willits, 1971; Karabenick, Lerner, & Beecher, 1973; see Piliavin et al., 1981, for a review). In results conceptually similar to those found by Rogers and Prentice-Dunn (1981), Gaertner and Dovidio (1977) found that Caucasian subjects helped an African-American confederate less frequently only when they believed others were present and available to help. When they thought that they alone were privy to the confederate's need for help, they helped Caucasian and African-American confederates at an equally high level. Thus, society may proscribe egalitarian norms and therefore lead members of an ingroup to help members of a stigmatized group. However, if the situation provides an excuse for not helping (e.g., other people could provide help), ingroup members helped outgroup members less. Once again, however, we might expect that social restraints on expressions of prejudice toward smokers might lead to less helping of smokers even when such diffusion of responsibility is not present. Research on helping behavior by nonsmokers toward smokers has supported this notion. Bennett and his colleagues have shown that helping is reduced both when secondary smoke is simply present in the environment (Bennett & Casey, 1989; Bennett & Kauffman, 1988) and when the person in need of help is identified as a smoker (Bennett, 1986). This held both when the individual in need of help was smoking, and when he or she was identified as a smoker but was not smoking at the time. In these studies the subjects were all given the opportunity to help the confederate on a one-to-one basis. Thus, the decrease in helping toward the smoking confederate was not related to an increase in diffusion of responsibility, as was the case with the African-American confederate in the Gaertner and Dovidio (1977) study. These results provide preliminary empirical evidence that there may be fewer social restraints on nonsmokers to express their negative feelings toward smokers.

Interpersonal distance. Social psychological research would also suggest that interpersonal distance would be influenced by the smoking status of the interactants. For example, interpersonal distance has been shown to vary as a function of the similarity of the interactants (Byrne, Baskett, & Hodges, 1971) with preferred distance increasing when interacting with stigmatized others (Dabbs & Stokes, 1975; Word, Zanna, & Cooper, 1974). Therefore, we might expect that interpersonal distance between a nonsmoker and a smoker would be greater than between two nonsmokers. The research in this area supports this hypothesis. Space needs of nonsmokers are greater when the other person in the interaction is smoking (Anthony, 1986; Kunzen-

dorf & Denney, 1982). Furthermore, fleeing an invasion of personal space occurs more quickly when the invader is smoking (Bleda & Bleda, 1978).

Taken in sum, this body of research suggests that, in addition to the cognitive and affective reactions of nonsmokers to smokers, there are a number of negative behavioral consequences associated with such interactions. Thus, in public areas in which smoking is not controlled it is likely that these negative responses will be evident in the interactions of the members of these two groups. It would be interesting to document the response of smokers to these negative behaviors, and of smokers' general perceptions of nonsmokers. However, I am unaware of any research directly dealing with this question. One might infer, however, that smokers are well aware of their stigmatized status and the negative responses they elicit from nonsmokers. The emergence of smokers' rights groups, for example, suggests that smokers are fighting back against the actions of nonsmokers to some extent.

Requests to stop smoking. In uncontrolled public settings, one behavioral response the nonsmoker may enlist is to ask the smoker to stop smoking. Despite the large number of negative reactions of nonsmokers to smokers, asking a smoker to stop smoking is relatively unusual. Davis, Boyd, and Schoenborn (1990) conducted a nationwide survey addressing various beliefs and behaviors related to smoking. They found that, although a majority of nonsmokers (62 percent) believed that ETS was detrimental to their health, only 5 percent reported that they would ask a smoker to stop smoking. The reluctance of nonsmokers to ask smokers to stop smoking has also been supported using a smoking confederate in both a lab setting (Gibson & Werner, 1992) and a field setting (Gibson & Werner, 1994). In the laboratory study only 13 percent of the nonsmokers asked the smoker to stop. These subjects were specifically selected because of their stated aversion to ETS. Similarly, field research at a large urban airport found that overall only 9 percent of airport users in a no-smoking area asked a smoking confederate either to move or to put out his cigarette (Gibson & Werner, 1994). In both studies the majority of the requests to stop smoking (73 percent and 67 percent respectively) occurred when interpersonal and situational cues provided strong support for such a request.

Many nonsmokers may refrain from asking a smoker to stop smoking because they fear a negative reaction from the smoker. Leedom, Persaud, and Shovein (1986) found that 56 percent of smokers who were asked, agreed to stop smoking. However, of those that continued to smoke, 31 percent (10/32) appeared either "hostile," "offended," or "irritated," while one smoker even blew smoke into the confederate's face. In addition, the nonsmoking researchers in this study reported feelings of anxiety throughout the data collection process. Thus, fear of these interactions may be prevalent and in some cases well founded. For public restrictions of smoking to operate smoothly, smokers and nonsmokers must be able to separate themselves successfully into their preferred areas without extensive "negotiation" or interaction between the parties.

Variables Related to the Successful Separation of Smokers and Nonsmokers in Public Areas

A number of early studies on this question concluded that the creation of new nonsmoking areas would not eliminate smoking without an explicit request to refrain from smoking (by confederates in the areas). For example, Jason and Clay (1978) found that in a barber shop the average amount of time customers spent smoking fell from an initial baseline measurement of 40.8 minutes to only 2.3 minutes after "no smoking" signs had been added. However, even after the signs were present, a number of customers (42 percent) still lit cigarettes and had to be asked to extinguish them by workers in the setting. Similarly, Jason, Clay, and Martin (1979-80) did not obtain total compliance unless polite requests accompanied new no-smoking signs in supermarkets and elevators.

A potential reason for the ineffectiveness of signs alone is that in each case an alternative smoking-permitted area was not provided for smokers. Perhaps compliance would increase in the absence of verbal prompts if smokers had an alternative area of their own. Jason and Liotta (1982) examined this question by creating a no-smoking area in a subsection of what had previously been an uncontrolled area in a university cafeteria, while leaving a "smoking permitted" area in the vicinity. The no-smoking area was created through the placement of signs on both walls and on tables. Once again, however, they found little compliance without verbal requests to refrain from smoking. An average of 7.7 individuals were observed smoking in the area during a baseline observation period, dropping to 5.3 smokers after the no-smoking signs had been placed in the area. Once again, compliance increased dramatically (only 1.6 smokers present) when signs were accompanied by polite requests from a confederate of the experimenter. Similar research in New Zealand found that, while smoking was significantly reduced in the new no-smoking area, fully one-half of all smokers in the cafeteria remained in the newly designated "smoke free area" (Fanslow et al., 1988).

Given the research demonstrating the general lack of willingness of nonsmokers to request that smokers stop smoking, the results of this line of research are somewhat discouraging. If verbal requests to refrain from smoking are necessary to induce compliance, then it would seem that the creation of smoking-permitted and no-smoking areas would not produce the desired effect of separating smokers and nonsmokers. However, more recent research suggests that separation of these groups can be successful if careful attention is paid to environmental cues.

In three studies, Gibson and Werner (1994) applied notions of environmental legibility to smoking-permitted and no-smoking areas in an urban airport. Legibility was increased by creating more distinct boundaries between the areas, and by eliminating smoking cues (i.e., ashtrays) in the no-smoking areas. By creating these legible areas, smoking in the no-smoking area was totally eliminated (0 smokers out of 330 people observed; as opposed to 64 smokers out of 448 people observed (14

percent) in the illegible no-smoking area. This was accomplished without prompting by experimental confederates. In addition, when a smoking confederate entered the no-smoking area, he was more likely to encounter persistent nonverbal cues or verbal requests that he should leave when entering the legible as opposed to the illegible area. Thus, enhancing legibility also enhanced resistance from nonsmokers. This research provides some encouraging evidence that separate smoking permitted and no smoking areas can work in public settings.

Conclusions

It seems clear from this review of the literature that the potential for conflict between these two groups is great when smokers are allowed to smoke indiscriminately among nonsmokers. Nonsmokers hold negative stereotypes of smokers, suffer from depressed mood states and increased anxiety when near a smoker, are more aggressive toward smokers, help smokers less than they do nonsmokers, and require more personal space when interacting with smokers. These findings are similar to findings in the social psychological literature dealing with ingroup-outgroup perceptions, stereotyping, and responses to members of outgroups. Thus, it would seem that in the current social zeitgeist, smokers have become a stigmatized outgroup.

Based on this analysis, the current trend to restrict smoking in public and in the workplace may benefit both smokers and nonsmokers. Nonsmokers receive the obvious health-related benefits associated with breathing cleaner air. In addition, evidence suggests that their performance in the workplace may also improve if provided with a smoke-free environment. Finally, they may also experience less anxiety. Smokers may benefit from this separation as well. They may also see performance increases if not worried about their smoke offending nonsmoking coworkers (cf., Kidd, 1973). Furthermore, if separated from nonsmokers, smokers may be less likely to suffer the negative behavioral consequences of their stigma (such as aggression, lack of helping, etc.). Unlike many other stigmatized groups, smokers can potentially hide their stigma from members of the outgroup, leading to the avoidance of overt expressions of prejudice and discrimination.

The research reviewed here also strongly suggests that relying on "common courtesy" (as suggested by an ad campaign of a leading tobacco manufacturer, cf., Gibbs, 1988) will not be successful in achieving the desired separation between smokers and nonsmokers. This ad campaign proposed that legislation has no place in the debate between smokers and nonsmokers. Instead, they argue that smokers and nonsmokers should negotiate public smoking among themselves on an individual basis, and that common courtesy on the part of both groups should be practiced. Clearly, the findings that nonsmokers hesitate to ask smokers to stop, and that when they do ask smokers to stop they are anxious about confronting an irritated smoker, suggest that legislated control of public smoking may be necessary to adequately regulate these interactions. The efforts of this legislation should be to encourage self-

separation of smokers and nonsmokers without the need for policing of areas by nonsmoking patrons. Some may argue that it should be left to individual businesses and others in charge of public areas to formulate their own regulations regarding smoking. However, Jason and Holton (1988) reported that many businesses in the Chicago area were hesitant to voluntarily restrict smoking for fear of losing some of their smoking clientele. This finding further supports the need for the legislated creation of no-smoking and smoking-permitted areas in public settings.

The question of how this separation into areas can be successfully implemented can also be addressed. Simply posting a few signs and placing a few ashtrays may not be enough, and unless done properly may serve to increase confusion and confrontation between these two groups. Those charged with creating these areas must do so thoughtfully so as to create areas that are physically and psychologically distinct from one another. This can be accomplished by using simple physical cues that convey where smoking is permitted or not permitted, and where boundaries to areas exist (cf., Gibson & Werner, 1994).

It is important to reiterate that the basis for these policy suggestions is research dealing with the social psychological impact of the close interaction of smokers and nonsmokers when smokers are free to smoke. Health questions concerning both smokers and nonsmokers were not directly addressed in this review. However, many individuals involved in health professions view the legislated separation of these groups as an opportunity to improve public health. The nonsmokers are seen to benefit from a decrease in exposure to ETS, while it is hoped that smokers may quit if public restrictions are stringent enough. In an attempt to increase the number of smokers who attempt to quit, many efforts at controlling public smoking have failed to provide smoking-permitted areas for smokers to indulge their habits (cf., Hadaway & Beyerstein, 1987). While the intentions behind these efforts may be worthy, one must consider alternative effects of such stringent regulations. First, overall compliance may be reduced if smoking-permitted areas are not provided for smokers (cf., Jason & Clay, 1978). Second, although no research tests directly for this effect, smokers may see such total bans in public areas as attempts to reduce their ability to control their own behavior, thus creating psychological reactance (cf., Brehm & Brehm, 1981). It may be the case that banning smoking completely in public areas could result in a strengthening of the smoking habit in many smokers rather than creating the reduction in smoking desired by those enacting these restrictions.

Unfortunately, the policy suggestions advocated here do little to address the prevalent stereotypes of smokers held by nonsmokers. Smokers have come to believe that they are being treated unfairly by nonsmokers (see Farley, 1994; Gibbs, 1988), and the research reviewed here suggests that they may be right. As with any other case in which one group holds unfounded stereotypes of another, it would be ideal if a method for overcoming these stereotypes could be proposed. Furthermore, if the legislated public separation of these groups continues, one must ask how this policy will impact these stereotypes. Is it possible that creating and enforcing the

public separation of smokers and nonsmokers could strengthen the stereotypes of the nonsmokers? First, we should consider the alternative of letting smokers and nonsmokers interact freely without any legislative restrictions. This would lead to more contact between nonsmokers and smokers who are smoking. Although intergroup contact may be a necessary condition for reducing prejudice and discrimination, it is not a sufficient condition to do so (cf., Mackie & Hamilton, 1993; Stephan, 1987, for reviews). For example, this body of research would suggest that equal status of the groups and working toward a common goal are necessary antecedents for contact to reduce prejudice and discrimination. Therefore, it is unlikely that simply allowing smokers and nonsmokers to intermingle with no controls on smoking would be effective in eliminating nonsmokers' stereotypes of smokers, and may, in fact, contribute further to the maintenance of those stereotypes.

If, however, legislated separation of smokers and nonsmokers continues, smokers may actually be able to reduce the strength of some of the negative stereotypes held by nonsmokers about them. This may occur because most nonsmoker interactions with smokers will now occur when the smoker is not smoking. This gives the nonsmoker the opportunity to meet and interact with smokers before becoming aware of the smoker's stigma. Some research would suggest that first impressions are strongly held and somewhat resistant to change (cf., Asch, 1946; Jones et al., 1968). By creating separate smoking-permitted areas, the first impressions of smokers made by nonsmokers would tend to be more positive, due to lack of awareness of the individual's smoking status. This may allow nonsmokers to form more positive first impressions of smokers, and perhaps lead those nonsmokers to revise their stereotypes once they have discovered that the individual is indeed a smoker. Another mechanism by which separation of smokers and nonsmokers may benefit smokers is the potential reduction in threat perceived by nonsmokers from smokers. If nonsmokers no longer need to be concerned with being forced to breath smoky air, they may view smokers as less threatening, and therefore come to view them less negatively than is currently the case (i.e., realistic group conflict may be reduced, cf., Bobo, 1983). Although this analysis is somewhat speculative and additional forces intensifying intergroup animosities may sometimes operate, it seems reasonable to expect that the two mechanisms discussed (facilitation of positive first impressions and reduction of perceived threat) may at the least prevent a worsening of nonsmoker attitudes toward smokers.

Finally, integrating the research on smoker-nonsmoker interaction with social psychological research on intergroup conflict provides some interesting theoretical benefits beyond the applied benefits discussed above. Recent research on the expression of prejudicial beliefs toward minorities has demonstrated a tendency of individuals to suppress overt expressions of such beliefs (cf., Devine, 1989; Gaertner & Dovidio, 1986). However, it should not be assumed that such social restraint will operate on prejudice toward all groups. Tentative evidence suggests that the suppression of nonsmokers' prejudicial beliefs about smokers is not a

common response. This is similar to results of research on overweight individuals. Crandall (1994) found that prejudice against such individuals exists, and that people who possess these prejudicial beliefs feel free to express them. Crandall also found, however, that this prejudice was not marked by self-interest on the part of the prejudiced individual. It seems likely that self-interest (in the form of desiring clean air to breathe) may be a component of nonsmokers' beliefs about smokers. In this way, the conflict between smokers and nonsmokers may be best summed up as an example of realistic group conflict (Bobo, 1983; Hepworth & West, 1988). Smokers and nonsmokers may feel that they are competing with each other for resources. (For nonsmokers the resources in question may be healthy lungs, fresh-smelling clothes and hair, etc.; for smokers the resources may be freedom of action and expression.) This competition for resources may enhance the development of the stereotypes and behavioral responses of nonsmokers toward smokers reviewed in this article. The ways in which the interactions between smokers and nonsmokers differ from other ingroup-outgroup interactions may play important roles in how these interactions progress. By studying the different structural relationships between various different ingroups and outgroups, social psychologists have the opportunity to explore different forms of prejudicial belief systems and to discover how those different belief systems may lead to differences in intergroup relations.

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Tobacco Farming and Public Health: Attitudes of the General Public and Farmers

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The tobacco industry remains a formidable influence in thwarting tobacco control efforts, in part because industry leaders have raised policymaker and public concern about how tobacco control might negatively impact tobacco farmers. In this study, we interviewed a random, stratified sample of 528 tobacco farmers in the Southeast and 991 U.S. residents about issues related to tobacco farmers. We found that a majority of the U.S. public expressed the belief that U.S. taxpayers subsidized tobacco farmers. This belief, combined with the strong opposition to tobacco farmer subsidies (15 percent thought there should be subsidies), likely play a role in public attitudes toward tobacco farmers. At the same time, however, we found reasonably strong public support for efforts to help tobacco farmers transition to new enterprises, although the public underestimates tobacco farmer interest in diversification. For example, two of three Americans believe that the government should help farmers make a living other than growing tobacco and over half thought that taxpayers should help pay for such programs. These data illustrate potential common ground for elected officials to consider as they attempt to concomitantly address the needs of farmers and the interests of the public. Ultimately, if the interests of tobacco farmers can be made clearly to the general public, and vice versa, pro-health and pro-farmer policies might well become a reality.

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"There are many, many good people who have been farming, growing tobacco, for generations in their families. They have a right to make a living for themselves and their families, and they will continue to do so . . . These good people, who farm the land and work hard, should not be left behind."

— President Clinton announcing FDA regulations on tobacco at an August 23, 1996 press conference.

Tobacco has long been an economic engine for the southeastern United States, with roots dating to pre-British colonialism when many Native-American tribes used nicotine in religious rituals. Tobacco use, however, is also the single most important risk factor for premature morbidity and mortality. Despite declining adult prevalence over the past thirty years, tobacco-induced disease still affects millions of Americans each year (U.S. Department of Health and Human Services, 1995; U.S. Department of Health and Human Services, 1989). Moreover, recent data suggest that the long-term, downward trend in adult tobacco use has stopped (Centers for Disease Control and Prevention, 1996) and that youth tobacco use is increasing (Centers for Disease Control and Prevention, 1996; U.S. Department of Health and Human Services, 1994).

The tobacco industry remains a formidable influence in thwarting tobacco control efforts, especially in tobacco-producing states, in part because they have raised policymaker and public concern about how tobacco control might negatively impact tobacco farmers and tobacco farming communities (Warner et al., 1996). Historically, expressions of concern about tobacco-dependent communities have been a key obstacle in the passage of tobacco control policies at local, state and federal levels. For example, concerns about the economic stability of tobacco farmers and tobacco farming communities were raised in Congressional discussions about raising tobacco excise taxes and in Food and Drug Administration deliberations on regulating nicotine as a drug. At the federal and state levels, tobacco farmers and industry lobbyists exert considerable influence. As Bob Geiger, a reporter for the *Lexington Herald-Leader* newspaper, noted, "The farmers' wrath probably was enough to kill the cigarette-tax increase proposed by President Clinton to help pay for his ill-fated health-care reform package." (Geiger, 1995c, p. G1.) Similarly, the president of the Kentucky Farm Bureau commented that "the companies saw how much they need the farmers when things get tough for them politically." (Geiger, 1995a, p. A8.) A lead article in the January 11, 1995 *Lexington Herald-Leader*, titled: "Tobacco Industry Fights FDA with Polls, Farmers, Smokers," noted that 50,000 Kentucky farmers had signed a petition opposing FDA regulation of nicotine (Geiger, 1995b, p. B1). These press accounts illustrate how the concern about tobacco farmers has become a key factor in opposition to public health policies. To better understand the underpinnings of this concern, the next section presents background data on tobacco farming.

Background Figures on Tobacco Farming

North Carolina is the top producer of tobacco in the United States, followed by Kentucky, Tennessee, South Carolina, Virginia, and Georgia. As the top producer, North Carolina generated over $1 billion from tobacco receipts in 1994, while Kentucky generated $841 million (USDA, 1996). The number of farms in the United States that grew tobacco, however, dropped 75 percent between 1954 and 1992 (from 512,000 to 124,000; Grise, 1995). Likewise, the total tobacco acreage and pounds grown have dropped over the past two decades, from 1,083,000 acres (2.2 billion pounds) in 1975 to 663,110 acres (1.3 billion pounds) in 1995 (USDA, 1996). The average tobacco farm grows about 7.1 acres of tobacco with sales averaging $29,000 (Grise, 1995). U.S. tobacco farmer earnings were $2.3 billion in 1995 ($1.82 per pound), compared to $2.2 billion ($1.03 per pound) in 1975 (USDA, 1996). Since the price-per-pound data are not inflation-adjusted, these data illustrate that farmers have earned increasingly less per pound of tobacco sold.

U.S. export of tobacco has changed very little in recent decades, while the U.S. share of the global marketplace has decreased substantially. In 1992, 574 million pounds of tobacco were exported, compared to 587 million pounds in 1981 and 606 million pounds in 1972. The United States had 11 percent of the global export market of tobacco in 1994, down from 17 percent in 1984, 28 percent in 1970, and 60 percent in the 1950s (Williams, 1995a). In 1993, the United States was the top worldwide producer of tobacco (642 million pounds), followed by Brazil (297 million pounds), Malawi (227 million pounds), and China (158 million pounds) (Geiger, 1994a). However, the share of the world tobacco market comprised of U.S. tobacco has dropped. For flue-cured tobacco, the United States produced 11 percent of the tobacco in the world in 1994, versus 40 percent during the late 1950s. For burley tobacco, the United States produced 32 percent of the world market in 1994, versus 82 percent during the late 1950s (Economic Research Service, 1995). With respect to imported tobacco, the United States remains the leading worldwide importer of tobacco (Economic Research Service, 1995). USDA data illustrate that American tobacco comprises a smaller portion of the global export market now than it did forty years ago (Economic Research Service, 1995). In addition, the amount of imported tobacco used in cigarettes manufactured in the United States has increased from 2 percent to more than 33 percent over the past twenty-five years (O'Connor, 1995).

The threat to U.S. tobacco farmers from foreign growers has grown substantially in recent years. There are now regular reports about the improved quality and lower costs of foreign tobacco, especially from Brazil, Zimbabwe, Malawi, Turkey, Greece, Italy, and China (Maddrey, 1995; Associated Press, 1995a; Associated Press, 1995b; Associated Press, 1995c; Torry, 1995; Williams, 1995a). Trade publications such as *Tobacco International* have noted that overseas tobacco is so much less expensive than U.S. tobacco that higher quality tobacco is the only factor

favoring U.S. growers, and even that is changing as foreign growers adopt U.S. technology and practices (Kilburn, 1994; Williams, 1995a).

The major factor contributing to these trends in U.S. tobacco farming is price. Brazilian tobacco, for example, sells for about 54 cents per pound, or about one-third the price of U.S. tobacco (Hughes, 1995; Sachdev, 1995; Williams, 1995a); the price that U.S. flue-cured tobacco sold for in 1950 (Williams, 1995a). American tobacco manufacturers and wholesalers spend millions of dollars each year to help foreign tobacco farmers with state-of-the-art technology, growing techniques, seeds, fertilizers, chemicals, and leaf-processing plants, particularly in Eastern Europe, the former Soviet Union, South America, and Africa (Geiger, 1994a; Williams, 1995b). As U.S. companies invest in permanent overseas tobacco farming and manufacturing facilities, and purchase foreign-grown tobacco for import into the United States, the future of the U.S. tobacco farmers rests on their ability to compete with the worldwide price of tobacco. As a result, foreign-grown tobacco now accounts for one-third of the tobacco in American-made cigarettes compared to 15 percent just twenty years ago. This figure does not include the large amount of foreign-grown tobacco that is used in the cigarettes made by American-operated divisions overseas (O'Conner, 1995). Indeed, U.S. tobacco companies have hundreds of subsidiaries, licensing agreements, and affiliates in almost seventy countries around the world (Anonymous, 1995). It is figures like these that have caused a small number of farmers to begin questioning their unconditional trust of tobacco companies and their distrust of health professionals, some of whom have advocated for farmer economic development programs via tobacco excise tax increases.

Likewise, over the past few years there has been mounting concern about the long-term health and economic future of the U.S. tobacco farmer (Hamilton, 1990; Williams, 1995a). Amidst this backdrop of a multi-decade decline in the U.S. smoking prevalence rate, and increasing U.S. tobacco company purchase of foreign-grown tobacco and production facilities (Kilburn, 1994; Williams, 1995a), a small group of health activists, elected public officials, health professionals, and growers have begun exploring together ways to help the U.S. tobacco farmer (Altman, 1995). Historically, however, there has been little interaction, and substantial distrust, between tobacco farmers and public health groups. Indeed, there is a perception among both constituencies that there is little common ground. Tobacco industry publications and public statements, and tobacco state politicians' defense of the industry, have fanned the flames of this mistrust. Andrew Schindler, then president and chief operating officer of R. J. Reynolds Tobacco Company, told farmers: "The anti-tobacco forces want to put us out of business and our employees out of jobs." (Maddrey, 1994, p. 13.) Likewise, in an August 21, 1996 interview on the proposed FDA regulations, Senator Jesse Helms (R-NC), said: "The president is in effect declaring war on 76,000 North Carolinians who gain their livelihood in one form or another from tobacco." (Schwartz & Harris, 1996, p. A1.)

Yet, despite all of these threats to the future of tobacco farmers, there has been little scientific investigation of what tobacco farmers think about a variety of policy, economic, and health issues, as well as what the general public thinks about tobacco farmers. The study reported here is the first to comprehensively explore an array of issues around tobacco farming, public policy, and public health.

Method

A random, stratified sample of tobacco farmers and tobacco allotment owners was compiled from a commercial list of: (1) tobacco allotment owners listed on U.S. Department of Agriculture, Agricultural Stabilization and Conservation Service (ASCS) records from the early 1990s (currently named the Farm Service Agency); (2) subscribers to a widely-read farm magazine; and (3) market research surveys of farmers. This list was comprised of individuals who farmed 95 percent of the farmland acres in the United States. The sample was stratified by amount of tobacco grown, type of tobacco grown (flue-cured, burley), and state (Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia, other). Interviews lasted approximately fifteen minutes and the response rate was 72 percent. This sampling procedure ensured that a broad cross-section of tobacco farmers and allotment owners was obtained. The number of obtained interviews with farmers was 528 (an additional 417 interviews were obtained from individuals who leased out their tobacco allotment–the results from these data are not discussed in this paper). Details of the sample of farmers and survey methods employed are reviewed in more detail elsewhere (Altman et al., 1996).

Respondents to the general public opinion survey were selected using the list-assisted dialing approach, where "base" telephone numbers are randomly selected from a nationwide list of telephone numbers (PhoneDisk, Data Base America, New Jersey, 1993). Numbers to be contacted were generated by replacing the final two digits of the telephone number with random digits. This approach has the advantage of including nonlisted telephone numbers, and has been shown to generally reflect a random sample of all active telephone numbers (Lepkowski, 1988). Since telephone numbers are frequently assigned sequentially, however, this calling approach has a much higher calling efficiency than random digit dialing. Potential respondents were asked to "share their thoughts on issues related to tobacco, especially tobacco farmers"—the response rate was 47 percent. The number of obtained interviews with the general public was 991. Interviews lasted approximately ten minutes. Both the farmer survey and the public opinion survey were completed during the spring of 1995.

We asked farmers about a variety of issues, including attempts at diversification, perceptions of barriers to diversification, views on tobacco policy issues, perceptions of the tobacco companies, and views on the health effects of tobacco. A subset of these questions, as well as others, was also posed to the general public.

Results

Table 1 summarizes responses of the public to a series of questions about tobacco farmers. Overall responses, as well as responses by level of educational attainment, are presented. The data illustrate considerable support for helping tobacco farmers transition to other enterprises, and relatively little support for subsidizing the growing of tobacco.[1] For example, 57 percent of the population thought that U.S. taxpayers should help pay for programs to help tobacco farmers transition, and two-thirds thought that the U.S. government should help tobacco farmers find ways to make a living other than from tobacco. Two-thirds of the public thought that there were crops or agricultural activities that were as profitable as tobacco-yet, 73 percent of tobacco farmers reported that nothing was as profitable as tobacco (Altman et al., 1996). There was mixed support for using tobacco excise tax increases to help pay for this assistance–53 percent supported a $1.00 increase in the federal tobacco excise tax with 5 cents set aside for tobacco farmers, but only 29 percent supported a 5-cent increase with all of the money set aside for farmers. In contrast, farmers were highly in favor of a 5-cent increase with all of the money set aside for them (72 percent support, see Table 2). Support for using tax dollars to help with this transition away from tobacco was correlated positively with education and nearly two of three respondents (63 percent) thought that an increase in the tobacco tax may cost some tobacco farmers their jobs. The data also revealed a perception among the majority of Americans (55 percent) that taxpayers subsidize tobacco farmers. On a related note, there was strong opposition to taxpayer subsidies of tobacco farmers (only 15 percent supported subsidies).

Table 2 summarizes responses to questions that were asked of both farmers and the general public. The data illustrate deep differences between these two groups–significant differences were seen on fourteen of the sixteen questions asked. Importantly, the public substantially underestimates tobacco farmer interest in diversification–whereas 51 percent of the farmers expressed interest in trying on-farm ventures to supplement their tobacco income, only 20 percent of the public thought that farmers were interested in supplementation. Similarly, there were substantial differences in perceptions of risk to tobacco farmers. Compared to the public, farmers were two to three times more likely to perceive risks from higher cigarette taxes, foreign competition, and restrictions on smoking in public settings. With respect to perceptions of the tobacco companies, farmers were more likely than the public (73 percent vs. 61 percent, respectively) to believe that tobacco farmers help tobacco companies oppose efforts by the government to regulate the industry. Interestingly, farmers as a whole are more politically active than the general public.

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[1]The federal government provides a relatively small direct subsidy to the tobacco program. Rather, the program is largely funded by contributions made by farmers themselves (i.e., through the no-net cost assessment program).

Table 1. Responses of the general public (in percentages)

Question	Overall N=991	HS or Less N=417	Some College N=218	College Grad N=349
Think that U.S. taxpayers subsidize tobacco farmers (% yes)	55	45	52	66*
Think that U.S. taxpayers should subsidize tobacco farmers (% yes)	15	19*	14	12
Think that U.S. taxpayers should help pay for programs that help tobacco farmers transition to other crops or agricultural activities (% yes)	57	51	55	67*
Think that there are crops or agricultural activities that are as profitable as tobacco (% yes)	63	62	62	65
Think that the U.S. government should help tobacco farmers find ways to make a living other than growing tobacco (% yes)	66	66	63	67
Support a $1.00/pack increase in the federal excise tax on tobacco (% support or strongly support)	48	40	46	58*
Support a $1.00/pack increase in the federal excise tax on tobacco if 5 cents was set aside to help tobacco farmers transition away from growing tobacco (% support or strongly support)	53	48	50	61*
Support a 5 cent/pack increase in the federal excise tax on tobacco if all of the money went back to tobacco farmers (% support or strongly support)	29	31	28	28
Would be more or less likely to support an increase in the cigarette tax if a portion of the revenue raised by the tax was used to provide aid to tobacco farmers (% indicating more likely)	22	17	21	29*
Tobacco farmers are responsible for health problems experienced by smokers (% agree or strongly agree)	29	31	30	27
Tobacco companies are responsible for health problems (% agree or strongly agree)	45	42	45	49+
Smokers are responsible for their health problems (% agree or strongly agree)	92	93	91	93
Increasing the tobacco tax may cost some tobacco farmers their jobs (% agree or strongly agree)	63	62	63	65

Note: + $p < .05$; * $p < .01$

Table 2. Responses of farmers and the general public (in percentages)

Question	Farmer n=528	Public n=991
Believe that smoking is harmful to people (% yes)	58	96*
Tobacco farmers are interested in trying other on-farm ventures to supplement tobacco income (% interested or very interested)	51*	20
Favor a 5-cent increase in the federal excise tax on tobacco if all of the money came back to tobacco farmers (% yes)	72*	29
If the tobacco companies do well, tobacco farmers will do well (% agree or strongly agree)	61	59
Tobacco companies care about tobacco farmers in the United States (% agree or strongly agree)	49*	46
Without the support of tobacco farmers, tobacco companies would be less effective in opposing efforts by the government to regulate the industry (% agree or strongly agree)	73*	61
Higher cigarette taxes pose a risk to tobacco farming (% indicating great risk)	69*	30
Foreign competition poses a risk to tobacco farming (% indicating great risk)	64*	21
Restrictions on smoking in public places pose a risk to tobacco farming (% indicating great risk)	47*	25
Decrease in the number of U.S. smokers poses a risk to tobacco farming (% indicating great risk)	38	37
Voted in the past two years (% yes)	91*	83
Wrote a letter to a politician in the past two years (% yes)	42*	31
Talked to a politician to express an opinion in the past two years (% yes)	54*	32
Contributed money to a politician in the past two years (% yes)	25*	17
Worked on a political campaign in the past two years (% yes)	17*	12
Educational attainment (high school graduate or less)	42	70*

Note: * $p < .01$

We also asked the general public what percent of the retail pack of cigarettes goes to growers. Three of four respondents (74 percent) reported that they did not know. Of the one-quarter who provided a response, the mean percent (17.6 cents) was an estimate six times greater than what farmers actually make (3 cents).

Discussion

In tobacco states, arguments centering on the importance of tobacco to the local economy are often presented as an issue of personal freedom to farm successfully, to grow chosen crops, and to continue multi-generational family and cultural traditions (Brooks, 1975). A billboard in South Boston, Virginia, is illustrative of this message. It reads: "Proclamation. WHEREAS: Any person or firms who engage in raising, selling, processing and manufacturing TOBACCO are welcomed to exercise the full and free rights to the enjoyment of TOBACCO PRODUCTS in the City of South Boston and the County of Halifax." Unbeknownst to many farmers, however, are the threats to their personal freedom to farm tobacco that stem from tobacco company policies and practices in foreign markets. In addition to foreign threats, farmers perceive substantial threats from pro-health interests, most recently, the Food and Drug Administration. Commenting on these threats, Wick Wickliffe, an Agricultural Extension agent in Guilford County, North Carolina, said: "It used to be if you were a tobacco farmer, you were looked up to, respected, a big businessman. Today, a lot of people think you're a harbinger of death. They look at those fields and say, 'Those farmers are growing death'" (Catanoso, 1994). Data from this study help to illuminate the concerns of farmers as well as the attitudes of farmers and the general public toward policy options to help farmers survive.

In this study, we found that a majority of the U.S. public expressed the belief that U.S. taxpayers subsidized tobacco farmers when, in fact, relatively little public money is used to run the tobacco program (around $20-$30 million per year). This belief, combined with the strong opposition to tobacco farmer subsidies (only 15 percent thought there should be subsidies), likely play a role in public attitudes toward tobacco farmers. At the same time, however, we found reasonably strong public support for efforts to help tobacco farmers transition to new enterprises. The data illustrate that two of three Americans believed that the U.S. government should help farmers make a living other than growing tobacco, and over half (57 percent) thought that taxpayers should help pay for such programs. These data are important because they illustrate potential common ground for elected officials to target as they attempt to concomitantly address the needs of farmers and the interests of the public. At the same time, because the general public underestimated how interested tobacco farmers were in diversification, public education is probably necessary before policies that help farmers and promote public health can be implemented. Ultimately, if the interests of tobacco farmers can be made clearly to the general public, and vice versa, pro-health and pro-farmer policies might well become a reality.

The data also illustrate that public opinions and behaviors were different from farmer opinions and behaviors on a number of dimensions, particularly related to issues around diversification, risks to farmers, some tax policies, and political involvement. While this is not surprising, it does point out the need for mutual education and understanding as public policies are pursued. Data from these two surveys raise a number implications for future efforts to help tobacco farmers compete into the next century and reduce the burden of health problems caused by tobacco. These more general issues are discussed below.

Tobacco companies and tobacco state politicians argue that economic devastation will occur if pro-health tobacco control policy is pursued. On August 22, 1996, Jim Hunt, the Democratic governor of North Carolina, went so far as to threaten a lawsuit against the federal government for allowing the FDA to regulate cigarettes as drug delivery devices (Rice, 1996). Governor Hunt suggested that FDA regulation would be detrimental to tobacco growers and manufacturing firms in the state. These arguments fail to note that the major threat to U.S. tobacco farmers comes from tobacco company expansion into foreign markets, not from public health policies. The threat from tobacco companies is difficult to estimate because the information is not widely shared. For example, American tobacco company purchases of foreign-grown tobacco do not necessarily appear in the import/export data published by the U.S. Department of Agriculture. Thus, if a U.S.-owned cigarette manufacturing plant in another country uses tobacco from that country's farmers, few U.S. farmers will know about it. As a case in point, the R. J. Reynolds affiliate in Xiamen, China, produces 2.5 billion cigarettes a year, but uses only Chinese-grown tobacco in its top-selling brand, Golden Bridge (Williams, 1995c). Popular brands such as Golden Bridge are known to the trade as "American-blend cigarettes." These cigarettes, which ostensibly contain U.S. tobacco, do not in fact use any American tobacco. Farmer activity in Zimbabwe also threatens U.S. growers. Between 1995 and 1996, tobacco growing in Zimbabwe increased by 8.4 percent. Exports from Zimbabwe to American-owned manufacturing facilities are growing exponentially (Maitland, 1996). Over time, expansion of high-quality, cost-efficient tobacco farming operations in Africa, Asia, and South America will gradually diminish much of the need for American tobacco.

To be fair, tobacco-growing states would experience some negative economic effects if Americans stopped using tobacco. A landmark study found that the United States overall would experience positive economic growth if tobacco use ceased immediately, but that job loss would occur in the South (Warner et al., 1996). This study estimated that between 1993 and 2000 there would be a net gain of 19,719 new jobs under smokefree conditions. The number of jobs lost in the southeast tobacco region, however, would be 36,584, but this would be offset by the gain of 56,303 jobs in other regions. Moreover, sensitivity analyses on worst-case scenarios (e.g., a sudden disappearance of cigarette use instead of the more likely gradual decrease) revealed no conditions that were ultimately disadvantageous to the nation as a

whole. As such, this study sheds new light on one of the key arguments that tobacco companies employ in opposing tobacco-related regulations—the loss of jobs. At the same time, it also reinforces the importance of developing creative solutions to the job loss that would occur in southern states as a result of declining tobacco sales. Many of these solutions require the development of policies to promote alternative economic enterprises for both small and large farmers.

One way to fund alternative enterprises is to increase state and/or federal tobacco excise taxes with earmarking for tobacco farmers and tobacco-dependent communities. Surgeon General Koop has argued the benefits of an earmarked tobacco tax increase to help farmers diversify (p. 3): "tobacco-state members of Congress should be fighting for their share of the pie to help their states into the economy of the 21st century." (Koop, 1994, p. 3). Income generated from an earmarked tobacco excise tax increase could help U.S. tobacco farmers reduce their dependence on tobacco and increase the likelihood that they can remain on the farm (Sweanor, Martial, & Dossetor, 1994). For example, a $1.00 increase in the federal excise tax on tobacco would generate approximately $14 billion annually (Richardson, 1994), a portion of which could be earmarked to help tobacco farmers transition to other enterprises. Data from our study illustrate reasonably strong support for an earmarked tax both among farmers and the general public. This is consistent with other public opinion surveys that reveal consistently strong support for increases in tobacco excise taxes—about two-thirds to three-quarters of Americans support increases (Richardson, 1994; Strouse, 1995). The data also illustrate, however, that nearly two of three respondents believed that an increase in the tobacco tax could cost some tobacco farmers their jobs. Changing this perception, both among farmers and the general public, is a critical step in marshaling strong support for earmarked excise taxes. Interestingly, tobacco companies have played into farmer (and public) concern about taxes by making opposition to tobacco excise taxes a key issue for tobacco farmers, even though the level of taxation will have a greater effect on industry income than on farmer income (Geiger, 1994b). That is, farmer profits are more closely linked to tobacco company practices than to tax rates. U.S. Department of Agriculture data makes this point clear. For every dollar spent on tobacco in 1993, farmers received less than 3 cents, tobacco companies received over 63 cents, with the rest going to excise taxes (29 cents) and retailers (5 cents). (Geiger, 1994b; Grise, 1992; Hamilton, 1993.) Data reported here illustrate that the general public does not know the proportion of the tobacco dollar that tobacco farmers receive. In addition, it is important to note that tobacco companies have raised the price of tobacco about 10 percent each year for over a decade, much more than governments have raised the tax on tobacco (Richardson, 1994).

In essence, an agricultural reinvestment program for tobacco farmers is needed to support the development and maintenance of alternative enterprises. Such a program could reduce financial risk for farmers who attempt new on-farm enterprises, support individuals who have successfully diversified and who agree to serve as role

models for other farmers considering alternative enterprises, offset start-up costs associated with acquiring needed labor, equipment, and supplies, and recruit associated enterprises that fuel successful operations (e.g., processing facilities, marketing systems). Such a program could be funded in part from earmarked tobacco excise tax increases and state and federal levels.

Beyond earmarked tax programs, tobacco farmers could take advantage of state-funded loan programs. In Virginia, for example, the Loan Guarantee Program and the Virginia Defense Conversion Revolving Loan Fund provide loans with low interest rates to small businesses that wish to diversify their operations (Tobacco Communities Project, 1995). Similarly, the Kentucky Highlands Investment Corporation of London (KHIC), along with the Cumberland Farm Products Cooperative and Kentucky's county agricultural extension agents, have proposed the Alternative Crop Venture Fund to offer matching loans to farmers wanting to experiment with new crops. If the experiment were to fail, the loan would be treated as a grant, thereby reducing the farmer's risk. Other proposals by KHIC include developing a capital resource fund that would offer diversified farmers loans at low interest rates (Cohn, 1995). Also, it is reasonable to ask tobacco farmers to help pay for diversification efforts. A precedence for this exists in the current "no-net-cost" program in which farmers and tobacco cooperatives subsidize the tobacco program by taxing themselves (United States Congress, 1982). This program was formed in 1982 and requires that the tobacco price support program be of no-net-cost to taxpayers.

The challenge of diversification at the level of the individual farmer will be to find and develop a fit between the skills and infrastructure capability of tobacco farmers. It is important to note that the process of diversification and conversion has already begun among a handful of farmers who cannot sustain increasing costs, decreasing profits, and the risk of overconcentration in tobacco. In another paper from this dataset (Altman et al., 1996), we found that younger, more educated farmers were more likely than older farmers to be interested in diversification. The Community Farm Alliance, the Center for Sustainable Systems, RAFI, and many other pro-farmer organizations are currently involved in efforts to develop such alternatives (Bates, 1995). In addition, tobacco farmers must become more aware of the primary threat they face—tobacco company involvement in overseas markets—and support creative solutions for diversification that might reduce these threats (e.g., earmarked excise taxes).

The challenge at the policy level is to foster farmers' risk-taking by limiting risk. Systems must be developed to take advantage of existing tobacco equipment and organizational infrastructure, provide technical assistance where needed, including feasibility analyses, market studies, business planning, and monitoring and evaluation, and help fund new economic infrastructures (Guillory, 1994; Hamilton, 1993). Along these lines, the Rural Advancement Foundation International noted (Bates, 1995, p. 198): "The handwriting is on the wall. . . . our goal should not be to save tobacco, but to save those whose livelihoods depend on tobacco." Hal

Hamilton, former director of the Community Farm Alliance, was also quoted in this article: "There is no single, high-value crop to replace tobacco, nor a single market channel to be created or subsidized. Instead the answer lies in a more complex, yet ultimately more long-lasting, solution: the development of agricultural infrastructure so that farmers can grow, sell, and process a wide variety of commodities other than tobacco." We found here that the general public probably overestimates the number of crops or agricultural enterprises that are as profitable as tobacco (about two-thirds thought there were profitable alternatives).

The challenge for public health professionals is to increase understanding of the needs of farmers so that effective advocacy for policies that both preserve rural farming communities and promote public health are pursued. From the perspective of public health, we believe that diversification and the subsequent economic development it produces will ultimately decrease public and policy-maker resistance to tobacco control. Indeed, if farmers, elected officials, and the general public believed that diversification was possible, desirable, achievable, and economically advantageous, a key obstacle to the passage of a diverse range of tobacco control policies would be lifted, leading ultimately to reduced tobacco use among the population.

An editorial written by Linda Brinson in the May 22, 1994 issue of the *Winston-Salem Journal*, perhaps the most pro-tobacco newspaper in the country, illustrates the sea of change that is occurring among tobacco farmers and the intersections between public health and tobacco farming:

> "My neighbors are out early these days, hauling trailer loads of tobacco seedlings from plant beds to the fields for planting. I watch them with nostalgia and sadness. . . . I sympathize with today's farmers, my neighbors, good people who cherish their way of life and who wonder why, after generations of honorable farming, they sometimes feel as if they are criminals. But those times are gone, just as sure as the mule Mary and the wood-burning barns are gone. Gone too, are my uncles. . . . For most of their years, my uncles were as ignorant as my long-ago ancestors were about any health risks of smoking. So were my parents, who both smoked when I was young, never realized the effect their habit probably had on my chronic respiratory problems. . . . But we all know more now, and it does little good to insist blindly that it's not so, that tobacco is still king. . . . The handwriting is on the wall, and it says, 'No smoking.'. . . I fear that our state's collective denial about the future of tobacco is going to cause distress for a lot of good people. . . . I worry that on the issue of tobacco, many North Carolinians today are doing the same thing. We spend too much energy resisting the inevitable and not enough looking for solutions. What we all need . . . is to stop blindly pledging allegiance to tobacco and start thinking about how our farmers and our broader economy are going to adjust to the coming changes. We do not need more loud negativism, but creative leadership."

We hope that data reported here will help farmers, public health groups, the general public, and policymakers respond to Linda Brinson's appeal for creative leadership.

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Predictors of Smoking Cessation and State-of-the-Art Smoking Interventions

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Smoking has strong behavioral and addictive qualities. To develop successful smoking cessation interventions, it is important to understand predictors of smoking cessation and their relationship to the psychological process of cessation. The purpose of this review is to first overview the most popular model of the processes of smoking cessation, the stage of readiness model. Next, the known behavioral and biobehavioral determinants of smoking cessation and smoking relapse are presented in relationship to stage of readiness. Determinants are grouped in four categories: demographic and smoking history; biological components; intrapersonal components; and situational/interpersonal components. Finally, a description of a state-of-the-art smoking cessation program is described, including cognitive/behavioral components and pharmocologic interventions. The information provided in this review will be useful in developing smoking cessation interventions tailored to the relevant characteristics of the target population.

Cigarette smoking is the single most preventable cause of premature mortality and morbidity in this country (USDHHS, 1994). Despite this, a large percentage of

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the adult population still smokes. This is largely because smoking, with its strong behavioral and addictive qualities, is an extremely difficult problem to treat (Klesges & DeBon, 1994). Overall, a full understanding of the determinants of smoking and smoking cessation is necessary to fully understand this tenacious problem.

The purpose of this review is threefold. First, we present an overview of the most popular model of the processes of smoking cessation, which indicates that one of the best predictors of smoking cessation is whether the individual is in a heightened state of "readiness" to change (i.e., quit smoking). Second, the known behavioral and biobehavioral determinants of smoking cessation and smoking relapse are presented in a comprehensive model. Finally, a state-of-the-art smoking intervention technique is described.

Stages of Change—A Model for Predicting Smoking Cessation

By far, the most popular contemporary theory of smoking behavior change is the Transtheoretical Model of Change put forth by Prochaska, DiClemente, and Norcross (1992). Originally researched for processes of change in smoking cessation, this theory has now been applied to a variety of health promotion behavior (Prochaska, Velicer, & Rossi, 1994). While a detailed description of this model and the supporting research is beyond the scope of this article, identification of the five stages of smoking cessation is important to understand how other predictors of smoking cessation may interact with readiness to quit smoking.

According to the Transtheoretical Model, there are five distinct stages of smoking. The least active stage is *Precontemplation*, during which there is no intention to change one's smoking behavior in the foreseeable future. Many individuals in this stage are unaware, or "underaware" of their problem (in this case, that smoking is harmful to health). In contrast, *Contemplation* is the stage in which people are aware that their smoking is problematic and are seriously thinking about quitting but are not yet ready to make a commitment to do so. Formulating a "decisional balance" (i.e., weighing the pros and cons of smoking) is an important aspect of this stage.

The next stage, *Preparation*, links intention to quit with behavior. Operationally, an individual is classified into this stage if he or she intends to make a cessation attempt in the next month and has made an unsuccessful cessation attempt within the past year. Individuals in this stage often report making behavioral changes, such as reducing (but not eliminating) their tobacco intake, or delaying the first cigarette of the day, but have not yet made a commitment to quitting entirely.

Action is the stage in which individuals have committed themselves to quitting, have made necessary behavioral changes to support this goal, and have achieved initial abstinence of from one day to six months. The final stage, *Maintenance*, involves working to prevent smoking relapse and consolidating the gains attained during action. Maintenance is viewed as a "continuation, not an absence, of

change." (Prochaska et al., 1992, pg. 1104.) Operationally, this stage is defined as occurring six months post-cessation and beyond.

While smokers, in general, progress through most of these stages and usually do so in order, it is possible to skip stages. For example, the smoker who has never contemplated quitting may suffer a heart attack and, based on physician recommendations, immediately stop smoking. In this example, the person "jumped" from Precontemplation to Action. Somewhat more rare, but still possible, is that individuals may be in more than one stage simultaneously. We have been conducting research in collaboration with the National, Heart, Lung, and Blood Institute and the U.S. Air Force to prevent relapse among new recruits following six weeks of forced smoking abstinence during basic military training. Many of these young recruits have been "precontemplators" until basic training began, fully plan to resume smoking the minute they are able, and yet, by definition, are in the Action phase. Although their "action" (i.e., decision to quit) is not willful, these individuals carry out the typical behaviors observed during the Action stage, including making the necessary behavioral changes to support the goal of abstinence, which is important if one values succeeding at military training.

Extensive research with the Transtheoretical Model has shown that readiness for change is an important predictor of smoking cessation outcome. In a prospective study of more than 1,400 smokers, stage of change was significantly related to the likelihood of making a quit attempt and actual success of the attempt (DiClemente et al., 1991). At a six-month follow-up, quit attempts during the previous month were reported by 25.6 percent of Precontemplators, 47.5 percent of Contemplators, and 79.9 percent of Preparers. Point-prevalent abstinence rates at six months among these three groups were 7.9 percent, 11.8 percent, and 20.8 percent, respectively. In a multicomponent smoking cessation intervention for cardiac patients (Ockene et al., 1992), biochemically validated abstinence rates at one year post-cessation were 14 percent for Precontemplators, 38 percent for Contemplators, and 72 percent for individuals in the Action stage.

Predictors of Smoking Cessation and Relapse

There are literally hundreds (and probably thousands) of studies that have examined predictors of smoking outcome, including a handful that have utilized the Transtheoretical Model. Unfortunately, most smokers are not in the Action stage. Aggregating across several studies, Prochaska et al. (1992) estimated that at any given time only 10-15 percent of smokers are prepared for Action, 30-40 percent are in the Contemplation stage, and 50-60 percent are in the Precontemplation stage. As such, there has been some work focusing on techniques to facilitate movement through the stages. Utilizing Janis and Mann's (1977) decision-making model, Prochaska (1994) reported that changes in "decisional balance" will predict progression from Precontemplation to Action. Specifically, Prochaska proposes that

smoking cessation interventions need to increase the pros of smoking cessation, or the cons of smoking, by about one standard deviation. Unfortunately, little is known about how to facilitate movement through the stages and how known predictors of smoking outcome relate to readiness to change. Figure 1 presents our working biobehavioral model of smoking cessation and relapse, integrating readiness to change with known predictors.

As can be seen in Figure 1, readiness to change is viewed as the primary catalyst for smoking outcome. Additionally, we envision at least four components that may either interact with readiness or exert independent influences on the smoking cessation process: demographics and smoking history; biological components; intrapersonal components; and situational/ interpersonal components.

The first component is Demographics and Smoking History. Knowing demographic and smoking history information will allow researchers to predict outcome with some degree of success, although the static nature of these variables limits using this knowledge to influence the cessation process. Age tends to be positively related to successful smoking cessation. In several, population-based studies (Bjornson et al., 1995; Freund et al., 1992; McWhorter, Boyd, & Mattson, 1990), older smokers were more likely to make a successful quit attempt, and were less likely to relapse. Although older smokers are more likely to have health problems related to smoking, and smoking-related health problems appear to increase motivation to quit, the effect of age on outcome appears to be independent of health status (McWhorter et al., 1990).

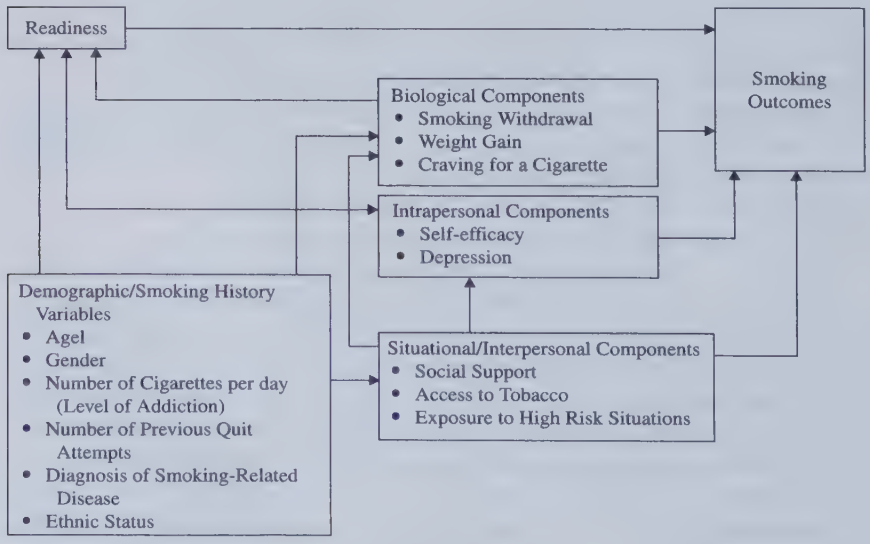

Fig. 1. Biobehavioral Model of Smoking Cessation and Relapse

Gender is also related to smoking outcome, with several prospective studies showing that women are less likely to maintain long-term abstinence than men (Bjornson et al., 1995; Freund et al., 1992; McWhorter et al., 1990; Ward et al., 1997). Reasons for this gender effect are unclear, but may be related to "decisional balance" differences. For example, men and women are known to differ in perceived benefits of smoking (e.g., women perceive greater mood management and weight-control benefits of smoking than men; Klesges & Klesges, 1988; Weekley, Klesges, & Reylea, 1992). In addition, there are demographic and smoking history differences such as disparities in education and age at quitting among men and women who attempt to quit (Bjornson et al., 1995; Jarvis, 1994).

Ethnic differences in smoking cessation have also been observed, with white smokers more likely to make a quit attempt and to be successful than black smokers (McWhorter et al., 1990; Wagenknecht et al., 1993). It is not known whether this is related to such factors as socioeconomic, cultural, nicotine dependence, or even biological differences between white and black smokers (e.g., metabolic differences in nicotine excretion; Wagenknecht et al., 1990). In terms of socioeconomic status, education level is positively associated with outcome in some (Bjornson et al., 1995) but not most studies (Freund et al., 1992; McWhorter et al., 1990), and income is related to attempted quitting but not to success at quitting (McWhorter et al., 1990; Wagenknecht et al., 1993). In one population-based study of young adults (CARDIA), white smokers remained more likely to quit successfully than black smokers, even after adjusting for demographic and smoking history characteristics, environmental exposure to others' smoking, and the type of cessation method used (Wagenknecht et al., 1993). Unfortunately, no studies have examined racial differences in readiness to quit or progression through the stages of change.

Several indices of psychological dependence on tobacco (e.g., the number of years as a smoker, length and number of previous quit attempts, amount smoked, biochemical measures of tobacco intake, and Fagerstrom Tolerance Questionnaire scores) have been examined with respect to smoking cessation. These have all been shown to be negatively related to outcome in prospective studies (Bjornson et al., 1995; Carey et al., 1993; Freund et al., 1992; McWhorter et al., 1990; Norregaard, Tonnesen, & Petersen, 1993), although discrepant findings exist (e.g. Kenford et al., 1994).

These demographic/smoking history variables are theorized to be related to readiness, as is the case with all the variables we describe. For example, an individual who has attempted smoking cessation many times may be highly ready to quit smoking, perhaps learning from each prior attempt (e.g., it is not uncommon for participants to say something like, "I quit for six months before. I know I can do it and this time I'm going to do it for good."). Alternately, a smoker who has failed many times previously may experience decreased self-efficacy about the possibility of succeeding, and thereby be less ready to quit.

The next set of variables we label Biological Components, which are primarily components of the nicotine withdrawal syndrome. Smokers will adapt their smoking topography (e.g., depth of inhalation, amount of time between cigarettes) in order to regulate their levels of blood nicotine and prevent the onset of withdrawal symptoms (Velicer et al., 1992). Smoking is positively reinforcing, both psychologically and biologically, and withdrawal from smoking produces immediate, negative withdrawal effects, the most pronounced being craving for a cigarette (Doherty et al., 1995; Hughes, Higgins, & Hatsukami, 1990). The majority of withdrawal symptoms (e.g., anxiety, difficulty concentrating, irritability, impatience, restlessness, and fatigue) occur within 24 hours of abstinence and peak within the first one to two weeks (Hughes et al., 1990). By six months, all withdrawal symptoms return to normal except for craving and weight gain (Hughes, 1992). However, craving greatly dissipates during the first six months after cessation, approaching but not reaching levels reported by long-term exsmokers. Similarly, the rate of weight gain is greatest during the first month post-cessation and levels off at around one year post-cessation (Klesges et al., in press).

While relapsers will often report that withdrawal symptoms were a precipitant of smoking relapse (Garvey, Heinold, & Rosner, 1989), prospective studies have generally not found that the number or intensity of withdrawal symptoms experienced predicts return to smoking (e.g., Hughes, 1992; Norregaard et al., 1993). The exception to this is that craving or urges to smoke (Doherty et al., 1995) and post-cessation increases in depression (Hughes, 1992) have been shown to predict relapse. Despite the rather weak support for withdrawal symptoms influencing outcome, there is ample evidence that nicotine replacement therapy (NRT) reduces smoking withdrawal and enhances smoking cessation (Cepeda-Benito, 1993; Fiore et al., 1994). Indeed, the basic assumption behind NRT is that it replaces nicotine that the smoker otherwise would have received in cigarettes, thus sparing the smoker from the biological aspects of withdrawal (West, 1984), although this notion has recently been questioned (West, 1992).

Regarding weight gain and smoking, there is some evidence that concerns regarding body weight predict smoking onset during adolescence (French et al., 1994). It also appears that fear of weight gain is a strong motivator for continued smoking. In two investigations, those individuals who reported that they did not intend to quit smoking in the future were also highly likely to have weight concerns or report the use of smoking as a weight control strategy (Klesges & Klesges, 1988; Weekley et al., 1992). There is also evidence that concerns about post-cessation weight gain predict relapse (Meyers et al., in press). In contrast to the literatures on smoking onset and concerns about weight gain, it is unclear whether actual weight gain is related to relapse. Since weight gain is so common after smoking cessation, weight gain, not surprisingly, predicts abstinence (Flegal et al., 1995). One recent prospective study of 289 individuals in a smoking cessation program found that weight gain during the first week post-cessation predicted abstinence through three

months. However, weight gain after three months was a significant predictor of relapse at six and twelve months (Norregaard et al., 1993). Overall, these data suggest that concerns about weight gain may decrease one's readiness to quit. However, once an individual commits himself or herself to quitting, a moderate amount of weight gain is considered acceptable. In a recent study of smokers enrolled in a smoking cessation program, 75 percent reported that they would not return to smoking even if they gained twenty pounds (Meyers et al., in press).

In our model (see Figure 1), biological components associated with smoking and smoking relapse are theorized to have direct effects on smoking outcomes. Moreover, biological components may impact readiness as well. Concerns about post-cessation weight gain may keep a smoker in the Contemplation stage, while acceptance of the possibility of weight gain may help move the person to Action. In addition, experiencing severe withdrawal symptoms during an unsuccessful cessation attempt or having had a large weight gain in a prior cessation may make an individual less "ready" to make another attempt. Conversely, if an individual successfully coped with withdrawal symptoms (including weight gain) in past cessation attempts, readiness for another attempt may be increased.

Next, it is known that several Intrapersonal Components are associated with smoking cessation. Probably the most studied of these factors is self-efficacy. As described by Bandura (1977), self-efficacy refers to the conviction that one can successfully execute a behavior to produce a desired outcome. In terms of smoking cessation, self-efficacy refers to confidence in one's ability to remain abstinent in a given situation. Several prospective studies have demonstrated that low self-efficacy predicts relapse (e.g. Gulliver et al., 1995). In addition, low self-efficacy has been shown to predict the particular situation in which relapse occurs (Condiotte & Lichtenstein, 1981) as well as lack of recovery from a lapse (Haaga & Stewart, 1992). Self-efficacy may be related to relapse due to its being a marker for other known predictors of relapse (e.g., inadequate coping skills, lack of previous success at cessation attempts) which influences how an individual responds to high-risk situations during cessation.

Knowledge or beliefs about the dangers of smoking also clearly influence the likelihood of successful smoking cessation. Smokers tend to exhibit "cognitive dissonance," denying or minimizing the risks associated with smoking. In contrast, successful quitters are more likely to identify smoking's risks (Halpern, 1994). Halpern and Warner (1993) examined the relationship of reasons given for smoking cessation with success in quitting. Concern about the health effects of smoking and setting a good example for children were significantly associated with successful cessation. However, interpersonal concerns (as discussed below) such as the effects of smoking on others and pressure from friends and family as reasons for cessation were not predictive of successful quitting.

Depression (whether conceptualized as a trait, such as "negative affectivity," a symptom, or a psychiatric diagnostic category) is another intrapersonal component

which influences smoking outcome, and likely influences readiness to quit as well. In treatment programs, individuals with either a history of depression or current depression are more likely to relapse (Glassman et al., 1993). Compared to nondepressed smokers, depressed smokers are more likely to be nicotine dependent (Carton, Jouvent, & Widlocher, 1994), to smoke as a way to cope with negative affect (Carton, et al., 1994; Kinnunen et al., 1996), and to experience greater withdrawal symptoms after cessation (Breslau, Kilbey, & Andreski, 1992). All of these factors are likely to impact on the depressed smoker's readiness to change, through influencing the "decisional balance" regarding the utility of quitting, as well as self-efficacy. A recent smoking cessation trial found that nicotine replacement was especially important for the depressed. While only 12.5 percent of depressed subjects successfully quit smoking for three months, 29.5 percent of depressed subjects who received nicotine gum quit successfully, a rate not significantly different from that of nondepressed nicotine gum users (37 percent) (Kinnunen et al., 1996). Knowledge by depressed smokers that they have a reasonable chance of succeeding at quitting may increase their readiness to make an attempt.

Finally, there are Situational/Interpersonal Components to smoking and relapse. That is, simple availability of tobacco and exposure to situations that are high risk for smoking may itself prevent or promote smoking and relapse. For example, there is currently a Food and Drug Administration proposal to ban all cigarette sales from vending machines, as this is reportedly a common source for cigarettes in smokers under the age of eighteen. The assumption is that reducing access to tobacco products will reduce smoking initiation rates. However, data we are currently analyzing from our laboratory on a cohort of 8000 schoolchildren suggest that vending machines are not a common source for youth, nor are they related to an increased incidence of regular smoking. Instead, children report simply buying their cigarettes in stores. Perhaps not surprisingly, the tobacco industry does not oppose this proposed FDA regulation.

There are documented times when smokers are forced to quit smoking, sometimes for protracted periods of time (e.g., hospital stays, during basic military training). Access to smoking is low, so rates of smoking plummet in these situations. However, once the environment changes (e.g., smokers leave the hospital and return to their "pro-smoking" environment), individuals return to smoking.

Exposure to high-risk situations is also related to smoking initiation and relapse. Exposure to smoking peers and friends, as well as pressure from peers to smoke, consistently predict smoking onset (Klesges & Robinson, 1995; USDHHS, 1994). Further, social situations involving exposure to others' smoking and alcohol consumption are predictive of relapse (Carey et al., 1993).

Social support is another interpersonal component that is known to affect smoking outcome and one that may influence readiness to quit as well. Greater perceived social support (from both one's partner and others in the social network) predicts successful cessation (Gulliver et al., 1995). Several specific supportive

behaviors that influence outcome have been identified, including facilitating the use of coping skills in high-risk situations, rewarding quitting, and empathic listening (Cohen & Lichtenstein, 1990).

We theorize that these Situational Components (Figure 1) can directly impact on smoking outcomes. It is not uncommon for a smoker to report that he or she has quit for an extended time, sometimes for years, only to relapse in one of these high-risk situations. For example, an exsmoker who is in a social situation with other smokers while drinking alcohol may fail to use coping strategies and relapse.

Interaction of Smoking Cessation Components

While each of the four types of components related to smoking cessation has been discussed independently, these factors may be interrelated. Demographic/smoking history variables may be related to biological components (e.g., smoking withdrawal). For example, the level of psychological dependence may be related to the intensity of smoking withdrawal (Niaura et al.,1989), although results are inconclusive due to inconsistencies in the definition and measurement of psychological dependence (Hughes, Higgins, & Hatsukami, 1990). In addition, women are more likely than men to be concerned about post-cessation weight gain (Klesges & Klesges, 1988) and are more likely to gain weight when they quit smoking (Nides et al., 1994).

Similarly, these demographic/smoking history background variables may relate to intrapersonal components (e.g., depression). For example, the observed gender differences in success at quitting smoking may be related partly to the fact that depression and negative affect negatively influence cessation (Hall et al., 1993), and women are known to have higher rates of depression and are more likely to report smoking in negative affect situations (Klesges & Debon, 1994; Ward et al., in press).

The influence of situational factors on outcome may be mediated by other components, including biological components. That is, exposure to these situations may increase cigarette craving, possibly through activation of appetitive motivational processes (Niaura et al., 1988). It is well known that craving for a cigarette has marked situational components to it (Niaura et al., 1988). Smokers may commonly report, following a relapse in a high-risk situation after having quit for an extended time, that he or she "had to have a cigarette." Unfortunately, very little is known regarding how these situational factors interact with other determinants of smoking.

To summarize, smoking cessation and relapse are multidetermined and complex. While one's state of "readiness" to quit is highly predictive of success, little is currently known about how to influence readiness or how this construct is related to known determinants of smoking cessation and relapse. A better understanding of how readiness is related to such determinants should greatly aid cessation efforts.

Smoking Cessation Interventions

Effective smoking cessation interventions fall under two general categories: (1) cognitive/behavioral approaches to cessation; and (2) pharmacologic approaches to cessation, typically nicotine replacement. Both approaches to cessation will be summarized and described.

Cognitive/behavioral interventions. A wide variety of behaviorally based smoking cessation interventions exist, offered in many settings ranging from minimal intervention self-help programs (e.g., Davis, Faust, & Ordentlich, 1984) to inpatient treatment units (Hurt et al., 1992). Behavioral interventions range from single "one shot" interventions to multicomponent techniques based on cognitive-behavioral principles. These techniques can be broadly classified as either aversive or self-management. Aversive techniques include smoke-holding, rapid smoking, and satiation. Self-management techniques include stimulus control, nicotine fading, cue extinction, relaxation training, contingency management, and coping skills training (see Schwartz, 1987 and USDHHS, 1988, for comprehensive descriptions of these techniques).

Formal smoking cessation clinics, usually based in university medical centers and psychology departments, have provided the forum over the last thirty years for the development of behavioral interventions (Shiffman, 1993). While only a small percentage of smokers who wish to quit use these clinics (Fiore et al., 1990), more recent intervention modalities such as self-help, worksite, and physician-delivered have been based on these clinic programs. As such, clinic programs are seen as a critical component of public health efforts to end smoking (Shiffman, 1993).

While many outcome studies have evaluated single behavioral techniques, the vast majority of studies have evaluated various combinations of behavioral techniques. Schwartz (1987) presented a comprehensive review of smoking cessation methods in the United States and Canada. The most successful programs are those that utilize multiple components. Schwartz (1987) reported that of seventeen multicomponent programs, two-thirds achieved at least a 33 percent quit rate at one year, with a median success rate of 40 percent. Longer-term abstinence rates of up to 40 percent during two to six years of follow-up have been reported in the better, replicable multicomponent behavioral programs (Glasgow & Lichtenstein, 1987). Although the specific techniques used in various smoking cessation clinics differ, Fisher et al. (1993) describe the "state-of-the-art" program as including the following five general components: (1) the setting of a specific quit date; (2) interruption of conditioned responses supporting smoking; (3) identification and preparation of plans for coping with temptations after cessation; (4) attention to relapse episodes and encouragement of continued nonsmoking; and (5) follow-up contact and social support for quitting and abstinence.

It has been difficult, however, to identify specific essential components of such programs (Glasgow & Lichtenstein, 1987). "Horse race" type studies, in which one multicomponent program is contrasted to another slightly modified program, have failed to yield significant differences (Lichtenstein & Glasgow, 1992). Despite a number of negative findings, it is noteworthy that the best long-term results come from multicomponent programs that include both aversive and self-management techniques (Tiffany, Martin, & Baker, 1986).

Overall, four conclusions can be drawn regarding behavioral smoking cessation clinics. First, the success of multicomponent programs may be more dependent on the amount of contact time given to subjects rather than on the specific techniques that are used. Interventions which provide more sessions spread out over longer time intervals produce the best results (Fisher, Glasgow, & Terborg, 1990; Lichtenstein & Glasgow, 1992). Second, although multicomponent programs produce better abstinence rates than less intense programs, overly complex programs tend to produce worse results (Fisher et al., 1990), possibly because subjects become overwhelmed and do not follow through on suggestions (Lichtenstein & Glasgow, 1992). Third, aversive techniques, such as smoke holding, appear to be useful when included in multicomponent programs. Lastly, relapse prevention training, although intuitively an important component to assure long-term cessation, does not seem to contribute substantially to multicomponent programs. Because such training is costly in terms of time, Lichtenstein and Glasgow (1992) have suggested dropping relapse prevention and encouraging relapsers to make another quit attempt.

Pharmacological interventions. Several pharmacologic agents have been used to aid in smoking cessation. These include nicotine blockade agents, antidepressants, anxiolytics, and even anti-hypertensive agents (e.g., clonidine). However, to date, only nicotine replacement therapy has been approved for use by the FDA. Nicotine is the major psychoactive constituent of tobacco. It has several psychoactive effects, including enhancement of mood and performance, can serve as a positive reinforcer, and is associated with withdrawal symptoms upon discontinuation of use (USDHHS, 1988). Several delivery mechanisms have been investigated, including nasal sprays and inhalers. Currently, there are only four commercially available nicotine replacement products, three of which are now available over the counter. Both 2-mg. and 4-mg. nicotine gum (NG) or polacrilex, are now available in this country without a prescription. One transdermal nicotine-delivering system ("the patch") has been recently approved for over-the-counter use, and it is expected that the other manufacturers of the patch will obtain similar approval. Nicotine nasal spray is available with a prescription.

It is important to note that nicotine replacement therapy, regardless of the mode of delivery, is supposed to be an adjunct to a formal stop-smoking program. That is, they are designed to be combined with a behavioral smoking cessation program. For

example, when describing Nicoderm (a patch marketed by Marion Merril Dow), manufacturers' materials state that "Nicoderm treatment should be used as part of a comprehensive behavioral smoking cessation program." (PDR, 1995, pg. 1411). Unfortunately, this is rarely the case in actual practice, although the vast majority of published studies on nicotine replacement therapy include some form of behavioral intervention.

Most of the research to date on nicotine replacement has been conducted on 2-mg. nicotine gum, the nicotine patch, and to a lesser extent, 4-mg. nicotine gum. The 2-mg. nicotine gum reduces withdrawal symptoms (Hughes et al., 1990) and boosts abstinence rates substantially over both placebo gum and no gum. Improved outcome, however, appears to be limited to use with adjutant behavioral treatment. Several quantitative reviews have reported twelve-month abstinence rates of 20–35 percent for NG combined with behavioral treatment (Cepeda-Benito, 1993).

In the past few years, 4-mg. nicotine gum became available commercially in the United States. Because dose is a major determinant of the effects of nicotine, increased dosage of nicotine gum has the potential to boost abstinence rates. However, few well-controlled studies have compared outcomes with 2-mg. vs. 4-mg. nicotine gum. In one such study (Tonnesen, et al., 1988), smokers were randomized to nicotine gum dose according to degree of nicotine dependence, and all subjects received group counseling. Among high dependent smokers, one-year and two-year abstinence rates were 44.4 percent and 33.3 percent, respectively, for smokers given 4-mg. nicotine gum, compared to 12.1 percent and 6.1 percent for smokers given 2-mg. nicotine gum. Similar trends were observed for smokers classified as low to moderate on dependence, randomized to receive either 2-mg. nicotine gum or a placebo. For these smokers, one-year and two-year abstinence rates were 38.3 percent and 28.3 percent, respectively, for the 2-mg. condition, and 22.6 percent and 9.4 percent for the placebo gum condition. In a recent study (Kinnunen, Doherty, & Garvey, 1995), a six-month abstinence rate was shown to increase as a function of both nicotine gum dose (0, 2, or 4 mg.) and the estimated percent of nicotine replaced. Thus, efficacy with gum is affected greatly by dosage.

Transdermal nicotine ("the patch") is a recent replacement method available commercially, which has quickly become very popular. This popularity is due, in part, to the absence of some of the side effects of nicotine gum, including unpleasant taste, dyspepsia, and mouth sores. The ease of use may boost adherence. The patch is designed to deliver nicotine into the systemic circulation via the skin. Currently, transdermal nicotine is available in sixteen-hour and twenty-four-hour patches and is recommended for daily use for up to twenty weeks, which may include a period of dose reduction (Palmer, Buckley, & Faulds, 1992).

There is solid evidence that the patch reduces withdrawal symptoms and increases abstinence relative to placebo patches. Several studies have reported that transdermal nicotine reduces overall levels of withdrawal discomfort (Hurt et al., 1994; Transdermal Nicotine Study Group, 1991). The patch seems especially effec-

tive in relieving negative affect and hypoarousal (Palmer, et al., 1992). In contrast to nicotine gum, transdermal nicotine appears to reduce craving for cigarettes (Transdermal Nicotine Study Group, 1991), but not to reduce weight gain (Li Wan Po, 1993). In a recent meta-analysis of seventeen double-blind, placebo-controlled studies, overall abstinence rates at six months were 22 percent for active patch vs. 9 percent for the placebo patch (Fiore et al., 1994). Twelve-month abstinence rates range from 17–35 percent for active patch groups, compared to 4–21 percent for placebo patch groups (Fiore et al., 1994; Hurt et al., 1994).

In summary, nicotine replacement therapy appears to consistently improve smoking cessation rates regardless of the delivery method. There is also evidence that combining nicotine replacement therapy with a multicomponent smoking cessation program produces cessation rates higher than either individual component (e.g., Cepeda-Benito, 1993). We recommend a combined pharmacologic and behavioral program, particularly for long-term smokers who have experienced significant withdrawal symptoms in previous cessation attempts.

Summary

The Transtheoretical Model of Change is a useful construct for evaluating a smoker's readiness to quit smoking. Numerous studies have shown that readiness for change is an important predictor of cessation. However, most smokers are not in the ultimate stage of readiness (Action). Other factors associated with smoking cessation are likely to interact with readiness or influence cessation and long-term abstinence (non-relapse) independent of readiness. These factors can be separated into four components: demographics and smoking history; biological components, mainly related to nicotine withdrawal; intrapersonal components; and situational/intrapersonal components. Smoking cessation interventions may involve these components, from a cognitive/behavioral perspective and/or through the use of pharmacological interventions.

Information on predictors of smoking cessation, especially predictors in specific subgroups of smokers, needs to be considered in designing future cessation programs. Tailoring programs to the more relevant components for any group is likely to produce greater levels of cessation and long-term abstinence.

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Evaluating the Impact of Statewide Anti-Tobacco Campaigns: The Massachusetts and California Tobacco Control Programs

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Despite more than 30 years of public health programs to reduce tobacco use, smoking is still the leading preventable cause of death in the United States. In response to this continuing epidemic, voters in California (1988), Massachusetts (1992), Arizona (1994), and Oregon (1996) approved ballot initiatives that established statewide tobacco control programs funded by cigarette excise tax revenues. Evaluating these innovative public health interventions is important, both to improve existing programs and to guide other states in developing and implementing similar interventions. In this paper we describe the methods being used to evaluate the statewide anti-tobacco campaigns in California and Massachusetts, and review the findings of process and outcome evaluations of both programs.

Our review suggests that both programs have had a substantial impact on the public's health by reducing cigarette consumption and stimulating the development of policies to reduce environmental tobacco smoke exposure. However, it does not appear that either program has reduced smoking initiation among adolescents. Our evaluation suggests three problems in program implementation that future anti-tobacco campaigns must avoid in order to produce long-term, sustained effects: (1) the gradual erosion of program funding by the state legislatures and governors; (2) the lack of a consistent, supportive constituency within state government; and (3) inconsistency in campaign themes, messages, and programs. We conclude by offering recommendations to correct these problems so that state-

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wide cigarette-tax-funded anti-tobacco campaigns can realize their potential to become one of the most effective public health interventions available.

Although tobacco is the leading preventable cause of death in the United States, expenditures for tobacco control represent only a small fraction of total spending for public health programs (U.S. Department of Health and Human Services [USDHHS], 1989). While there are effective strategies to reduce tobacco consumption, (e.g., cigarette excise tax increases, clean indoor air legislation, anti-smoking media campaigns, and community-based prevention initiatives [USDHHS, 1989]), these approaches require sustained, high levels of funding in order to counteract the $4.8 billion that the tobacco industry spends each year to promote tobacco use (Federal Trade Commission, 1996).

In an effort to provide such a reliable and substantial source of funding, voters in California (1988), Massachusetts (1992), and Arizona (1994) approved ballot initiatives that increased the state cigarette excise tax and used the revenues to establish comprehensive, ongoing, statewide tobacco control programs. Voters in Oregon (1996) recently approved a similar ballot initiative. These interventions may have significant public health benefits, because they combine an increase in cigarette price (which by itself will reduce cigarette consumption) with the earmarking of revenues to support a wide range of statewide and community-based programs, including mass media campaigns, development of clean indoor air policies, and mobilization of communities to implement local prevention initiatives. During its first seven years, the California tobacco control program spent a total of $694 million (Aguinaga et al., 1995) to implement its tobacco education and prevention initiative (Proposition 99); Massachusetts spent $116 million (Begay & Glantz, 1995) to implement its initiative (Question 1) during its first three years.

Evaluating these statewide tobacco control campaigns is important for two reasons: (1) to provide state public health planners and policymakers with feedback on the effectiveness of the program to guide them in refining program interventions; and (2) to inform policymakers and program planners in other states who may be considering similar interventions.

In this paper we provide an overview of the interventions being carried out in Massachusetts and California, describe their design and evaluation methods, and review the major process and outcome findings. We then discuss the public health significance of the findings as well as the difficulties in interpreting the results of these evaluations. Finally, we offer recommendations for other states, based on the Massachusetts and California experiences.

The Interventions

The ultimate goal of the tobacco control programs in both Massachusetts and California is to reduce the public health risks associated with tobacco use by:

(1) increasing the rate of adult smoking cessation; (2) reducing the rate of smoking uptake by teens; and (3) reducing exposure of nonsmokers to environmental tobacco smoke (ETS). The two programs use numerous interventions delivered through multiple channels to reach state residents in a variety of settings. Most activities fall into one of three major categories. A high-profile media campaign, targeted at adult smokers, youth, and the public in general, presents anti-smoking messages through television, radio, print media and billboard ads. The messages have been designed to de-glamorize smoking among young people, expose the dishonesty of the tobacco industry, encourage smokers to quit, and publicize the health risks of exposure to environmental tobacco smoke. Both states fund programs to establish community-based tobacco control efforts within existing institutions, such as local boards of health, local health departments, and primary care health organizations, and to put new initiatives, such as youth prevention programs, in place. The local programs provide cessation counseling and/or public information and education services. Most also work to promote local policies, regulations, and ordinances limiting smoking in public places or restricting youth access to tobacco. A series of statewide initiatives feature cessation counseling services provided through a telephone hotline and technical assistance to employers in establishing worksite smoking policies. The statewide programs also include efforts to build the tobacco control infrastructure, such as the development of a tobacco information clearinghouse and a series of technical assistance, education, training, and networking initiatives. Detailed descriptions of the interventions have been published elsewhere (Coye et al., 1996; Hammett et al., 1995).

Although the California and Massachusetts programs are similar in many ways, there are a number of important differences. First, California's program was initiated four years before the Massachusetts program. Thus, the Massachusetts program has been in the field for a shorter period of time.

Second, the level of opposition exerted by the tobacco industry in the two states has differed. The California tobacco control program was met with a massive response by the tobacco industry. With resources that overwhelm those available to the state, the tobacco industry pumped $1 million per day into a pro-tobacco media campaign in California, contributed more heavily to California legislators than to members of the U.S. Congress, and funded local "smokers rights" groups that attempt to block and overturn tobacco control regulations (Begay, Traynor & Glantz, 1993). Although the tobacco industry is also a factor in Massachusetts politics (e.g., several lobbyists for the Massachusetts Restaurant Association, which opposes local attempts to establish smoking bans in bars and restaurants, also lobby for the tobacco industry), there has been a somewhat less intense response. Nevertheless, the tobacco industry has a strong influence on state legislation in California and Massachusetts, and both programs have experienced extensive diversion of the funds collected through the excise tax to nontobacco control purposes.

A third difference between the two programs is the ratio of tobacco control expenditures to population size. Between 1989 and 1994, the California tobacco control program spent about $61.33 million per year (Novotny & Siegel, 1996). Based on California's population of 33 million, this results in an annual per capita expenditure of approximately $1.85. Massachusetts spent about $38.67 million per year on tobacco control between 1993 and 1995 (Begay & Glantz, 1995). With a population of only six million, this represents an annual per capita expenditure of about $6.43. Thus, the Massachusetts program may have administered a more intensive dose of anti-tobacco intervention each year.

Data Sources for Evaluation

In order to document the nature and scope of program activities, both states funded the development and administration of a Management Information System (MIS). Inputs into this system are standardized reports filed by funded programs and the recipients of their services. The data include information on the goals, structure, and staffing of the funded program, monthly summaries of program activities, characteristics of program participants, tracking of tobacco-related ordinances, and other information. The MIS helps to establish what activities were carried out, the number of people reached, what smoking or access restrictions were put into place in particular communities, and how effectively restrictions on smoking have been enforced.

In addition to the MIS, both states have conducted population-based, baseline, and follow-up surveys, funded by the tobacco tax revenue. Both the California Tobacco Surveys (CTS) and the Massachusetts Tobacco Surveys (MTS) are random-digit-dial telephone surveys of adults (ages 18 and over). In California, the baseline cross-sectional survey was conducted in 1990 and follow-up cross-sectional surveys were conducted in 1992 and 1993. In both 1990 and 1992, a systematic sample of adults was selected for interview. In 1993, however, due to lower funding levels, interviews were conducted with any adult household resident who answered the phone and consented to be interviewed. This practice usually results in a less representative sample than when random selection procedures are used; consequently, comparisons of the earlier surveys with the 1993 findings must be made with caution. In Massachusetts, the baseline survey was conducted in 1993 and follow-up cross-sectional data is available for 1995 based on an ongoing, monthly, random-digit-dial survey. Although both surveys systematically selected the adult for extended interview from all adults living in the household, the 1995 sample was considerably smaller than the baseline and did not oversample smokers. Thus, data on changes among smokers tend to have lower statistical power. Detailed information about the methodology of the CTS and MTS has been published elsewhere (Pierce et al., 1994; Biener & Roman, 1996).

Process Evaluation

Process evaluation in both states indicates reasonably widespread penetration of the tobacco control intervention. In Massachusetts, by 1995, local programs sponsored or participated in more than 9,000 community events. The total reported attendance at these events was nearly three million. In the same year, more than 500 smokers per month received cessation counseling services from programs funded by the Massachusetts Tobacco Control Program (MTCP) (Hamilton & Harrold, 1996). In California, between 1990 and 1994, local health departments conducted more than 10,000 multi-session programs focusing on prevention (61 percent), cessation (37 percent) and ETS (2 percent) (Elder et al., 1996).

The CTS and MTS also document widespread exposure to the media campaigns in both states. In 1992, more than half of the adult respondents in California and more than 80 percent of the adolescent respondents recalled having seen or heard anti-tobacco messages (Pierce et al., 1994). In Massachusetts in 1995, 65 percent of the adult population was aware of the statewide anti-tobacco campaign, and 76 percent recognized the tag line of the media campaign, "It's time we made smoking history" (Biener & Roman, 1996). An estimated 89 percent of adult smokers reported having heard, read, or seen information about quitting smoking within the past year (Biener & Hamilton, 1996).

Auditing program expenditures is also important in evaluating the effectiveness of program implementation. Although voters in California and Massachusetts mandated that cigarette tax revenues be used primarily for tobacco education and prevention, state lawmakers must enact enabling legislation to appropriate funds to carry out the voters' intent. In both states, the governor and legislature have diverted a substantial amount of funding from tobacco control programs to other uses, most notably to medical services. As a result, expenditures for tobacco control have steadily decreased in California, and have begun to decline in Massachusetts.

Proposition 99 expenditures for tobacco education, prevention, and research declined from $133 million during the first year of the program (fiscal year 1989–1990) to $57 million during the 1995–1996 fiscal year (Aguinaga et al., 1994) (Table 1). Despite the voter mandate that 25 percent of Proposition 99 tax revenues be used for tobacco programs, the legislature appropriated only 18 percent of the total revenues for this purpose during the first seven years of the program; a total of $285 million has been diverted from tobacco programs (Aguinaga et al., 1994).

Question 1 expenditures for activities of the Massachusetts Tobacco Control Program decreased from $43 million during the program's first year to $35 million during its third year, a reduction of nearly 20 percent (Begay & Glantz, 1995) (Table 2). Although the voters' intent in passing Question 1 was primarily to fund anti-tobacco programs, only 28 percent of the Health Protection Fund expenditures have been used to support the MTCP (Begay & Glantz, 1995).

Table 1. Proposition 99 expenditures (in millions of dollars) for tobacco and nontobacco programs — California, 1989-1996.

Fiscal Year	1989–90	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96	TOTAL
Expenditures for tobacco education, prevention, and research	133	168	89	113	72	61	57	694
Non-tobacco expenditures	639	504	474	437	433	371	357	3216
Total expenditures	772	672	563	550	505	432	414	3909
% of total expenditures for tobacco programs	17.3	25.0	15.8	20.6	14.2	14.1	13.7	17.7
Amount of money diverted from tobacco programs[a]	60	0	52	24	55	47	47	285

Source: Aguinaga et al., 1995. Expenditures for FY 1993–1994, 1994–95, and 1995–96 are projected, based on Governor's budget and Proposition 99 enabling legislation.

[a] Proposition 99 required 25% of funds to be allocated to tobacco programs.

Table 2. Question 1 Health Protection Fund expenditures (in millions of dollars) for the Massachusetts Tobacco Control Program (MTCP), 1993-1996.

Fiscal Year	1993–94	1994–95	1995–96	TOTAL
Expenditures for MTCP	43	37	35	116
Other expenditures	121	90	94	307
Total expenditures	166	128	130	423
Percent of total expenditures for MTCP	26.4	29.1	27.3	27.5

Source: Begay & Glantz, 1995. Expenditures for MTCP including funding for media campaign, statewide initiatives, research and evaluation, demonstration projects, and local initiatives. Expenditures for comprehensive school health education program and drug abuse resistance education programs are not considered to be part of the MTCP.

Outcome Evaluation

There are four major outcomes that must be assessed to determine whether the California and Massachusetts tobacco control programs are achieving their goals: changes in tobacco use among adults and teens, the development of community tobacco control policies, changes in environmental tobacco smoke exposure, and changes in public attitudes. In this section, we describe the potential outcome variables of interest, describe the sources of information regarding these variables, and report the results that are available to date.

Tobacco Use

Cigarette consumption. Cigarette consumption is one of the first measures of smoking behavior to change in response to effective tobacco control programs. Cigarette consumption is a sensitive enough measure to detect the impact of events such as the release of the 1964 Surgeon General's report, the Fairness Doctrine, and the ban on cigarette advertising in electronic media (USDHHS, 1989). State cigarette consumption is measured quarterly using sales tax data, and is reported by The Tobacco Institute (The Tobacco Institute, 1995). To account for changes in population, per capita cigarette consumption is generally used to assess the impact of statewide tobacco control programs.

Per capita cigarette consumption has several limitations as an evaluation measure. Changes in consumption only reflect changes in a state's cigarette sales; the evaluator cannot determine whether these effects are due to changes in smoking prevalence, the frequency and length of quit attempts by current smokers, or a reduction in the average number of cigarettes smoked by current smokers. Furthermore, cross-border smuggling of cigarettes due to the price differential between states can result in an underestimate of the true cigarette consumption within an intervention state (Harris et al., 1996).

Prior to Proposition 99 (from 1980 to 1988), the average rate of decline in per capita cigarette consumption was similar in California (2.7 percent per year) and the United States (3.0 percent per year) (The Tobacco Institute, 1995, 1996) (Figure 1). From 1988 to 1995 (the first seven years in which Proposition 99 was in effect), the average rate of decline in per capita cigarette consumption in California doubled to 5.4 percent per year, while per capita cigarette consumption in the United States continued to decrease at an average rate of 3.0 percent per year. Several econometric studies have demonstrated that Proposition 99 was associated with a significant decline in per capita cigarette consumption in California, controlling for differences between California and the U.S. in baseline consumption trends (Glantz, 1993; Hu, Sung, & Keeler, 1995a; 1995b; Novotny & Siegel, 1996; Pierce et al., 1994). Most recently, Hu et al. (1995b) reported that Proposition 99 reduced per capita cigarette consumption by 10-13 percent. This translates

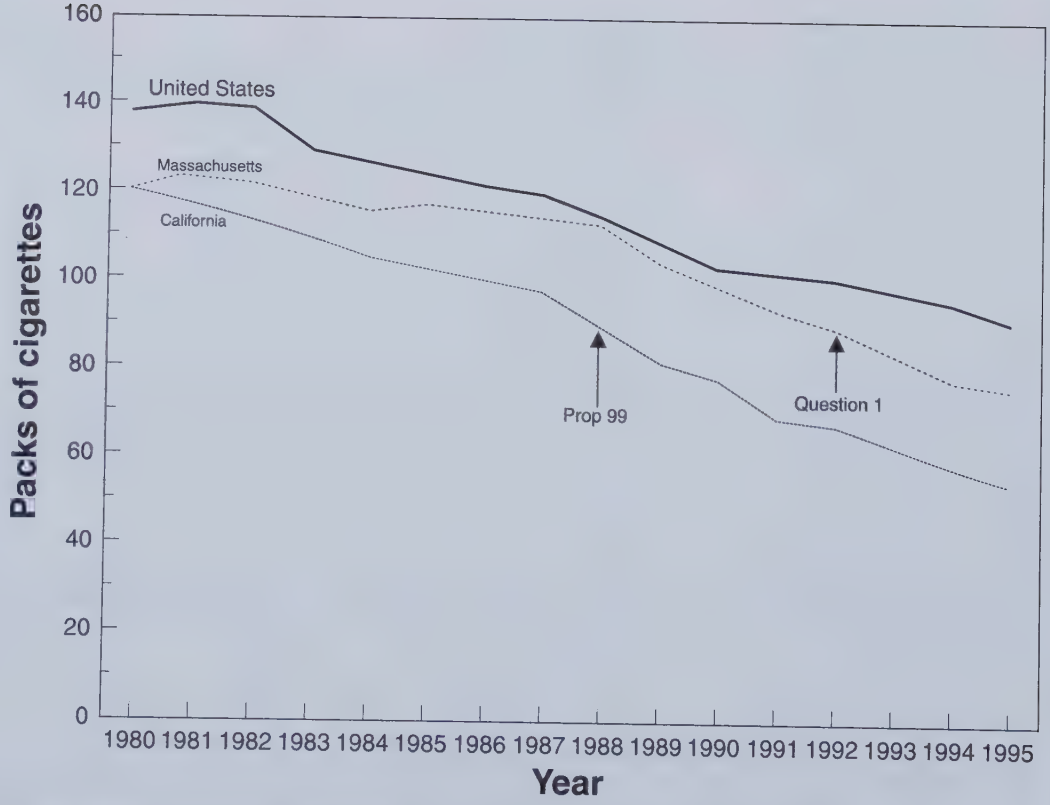

Fig. 1. Per capita cigarette consumption—Massachusetts, California, and the United States, 1980–1995.
Source: The Tobacco Institute, 1995, 1996.

into a reduction in consumption of 802 million packs of cigarettes in California during the period 1989 to 1993 (Glantz, 1993).

Prior to Question 1 (from 1980 to 1992), the average rate of decline in per capita cigarette consumption was similar in Massachusetts (2.6 percent per year) and in the United States (2.7 percent per year) (The Tobacco Institute, 1995, 1996) (Figure 1). From 1992 to 1995 (the first three years in which Question 1 was in effect), the average rate of decline in per capita cigarette consumption in Massachusetts doubled to 5.3 percent per year; during the same period, per capita cigarette consumption in the United States decreased by an average of only 3.8 percent per year. Thus, Question 1 was associated with a substantial reduction in cigarette consumption (Harris et al., 1996).

Adult smoking prevalence. The ultimate goal of statewide anti-tobacco campaigns is to reduce the prevalence of smoking. The enabling legislation for California's Proposition 99 set as a goal the reduction of adult smoking prevalence by 75 percent by the year 2000 (Novotny & Siegel, 1996). Similarly, Massachusetts set a goal of reducing the prevalence of adult smoking by 50 percent by the year 2000 (Hammett et al., 1995). Thus, smoking prevalence is a critical, long-term outcome evaluation measure.

Although program designers have tended to base program goals on smoking prevalence, this measure has two important limitations for outcome evaluation. First, smoking prevalence changes slowly, and it may take many years before the impact of an intervention on smoking prevalence is measurable. Second, assessment of smoking prevalence is subject to sampling and measurement bias. The external validity of survey results may be influenced by differences in the mode used to measure smoking prevalence (e.g., telephone survey, household survey, self-administered survey), the definition of smoking prevalence (every-day smoking versus some-day smoking), and the ascertainment mechanism (self-report versus proxy response).

Because of the range of potential data sources, surveillance of smoking prevalence to assess the impact of statewide tobacco control interventions is not straightforward. Since the CTS and MTS were initiated after implementation of Proposition 99 and Question 1, they do not provide baseline data to estimate the pre-intervention trend in smoking prevalence. Prior to the implementation of their statewide tobacco control programs, California and Massachusetts conducted only one annual survey to measure smoking prevalence: the Behavioral Risk Factor Surveillance System (BRFSS) survey. This survey is directed by the Centers for Disease Control and Prevention (CDC) and contains several items on tobacco use. Since the BRFSS is a state-based survey, and not all states have participated each year, national estimates of smoking prevalence cannot be derived.

Two other national surveys provide periodic data on adult smoking prevalence. The National Health Interview Surveys (NHIS) were conducted periodically prior to

1990 and annually since 1990. The NHIS is designed to provide national estimates; however, because California is such a large state, it yields a sample large enough to generate a reasonably accurate estimate of smoking prevalence (Pierce et al., 1994). The Current Population Surveys (CPS), a national survey carried out by the Bureau of the Census primarily to track employment rates, is designed to yield state estimates. In 1985, 1989, 1993, and 1995, it included measures of tobacco use.

Several studies have examined the impact of Proposition 99 on adult smoking prevalence in California (Pierce et al., 1994). These studies used NHIS data to estimate the pre-intervention trend in smoking prevalence in California and data from several surveys (CTS, CPS, BRFSS, and NHIS) to estimate the post-intervention trend (Novotny & Siegel, 1996). Because using one survey to estimate the baseline trend and another to estimate the post-intervention trend may result in a biased evaluation of the intervention's impact on smoking prevalence, we present here only the data from the BRFSS, which has been conducted annually in California since 1984. These data were reported by CDC in its most recent BRFSS summary report, which includes data through 1994 (CDC, 1996a).

The BRFSS trends in adult smoking prevalence in California (CDC, 1996a) are similar to those in the nation as a whole, estimated from NHIS data (Giovino et al., 1994; CDC, 1994a, 1994b, 1996b) (Figure 2). Statistical analysis of these trends is beyond the scope of this paper. Visual inspection of the data suggests that there has not been an acceleration in the rate of decline in smoking prevalence since the implementation of Proposition 99; however, smoking prevalence continues to decline in California during a period in which it remains stable in the nation as a whole.

Because the Massachusetts Tobacco Control Program has been in place for only three years, it is too early to expect a measurable decline in adult smoking prevalence. The data presented here (Siegel, 1996) represent a baseline that can be used to monitor changes in smoking prevalence as the program continues to develop in the years ahead. Again, since there are no baseline trend data from the MTS, results from the BRFSS only are presented here.

The trend in adult smoking prevalence in Massachusetts, based on unpublished data from the BRFSS (Siegel, 1996) is roughly parallel to the trend in the United States as a whole, established from NHIS data (Giovino et al., 1994; CDC, 1994a, 1994b, 1996b); both show little change during the past two years (Figure 2).

Adult smoking patterns. Since cigarette smoking is such an intransigent habit, it is common for the cessation process to extend over many years. Consequently, researchers need to examine intermediate indicators of progress toward cessation in order to evaluate the short-term impact of cessation interventions. The level of addiction to nicotine is one such indicator; it is commonly assessed by examining the number of cigarettes smoked per day and whether or not the smoker smokes within thirty minutes of awakening. Another indicator of progress toward cessation is the frequency and length of quit attempts.

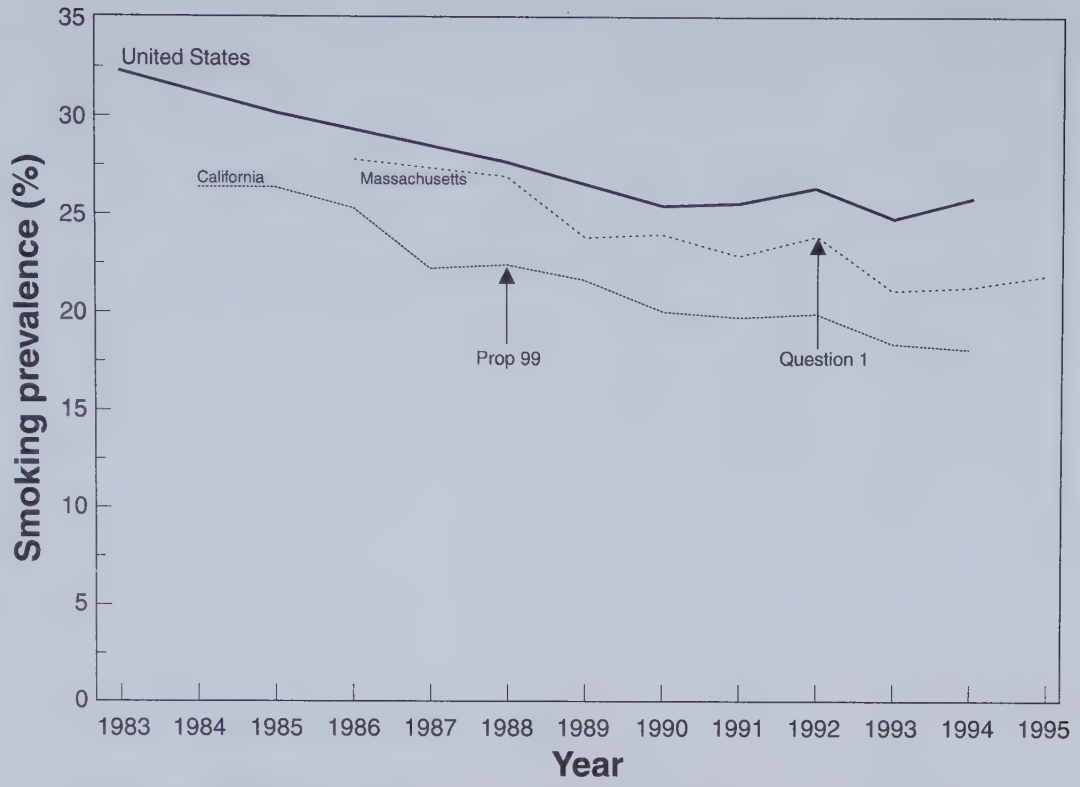

Fig. 2. Current smoking prevalence, adults (ages 18+)—Massachusetts, California, and the United States, 1983–1995.
Sources: Giovino et al., 1994; CDC, 1994a, 1994b, 1996b; Siegel, 1996.
Notes: U.S. Data from National Health Interview Survey. State data from Behavioral Risk Factor Surveillance System surveys.

Information about adult smoking patterns is available from the CTS and MTS. The California surveys do not show a reduction in the proportion of heavy smokers or an increase in the proportion of lighter smokers during the period 1990–1993 (Table 3). However, the proportion of smokers who attempted to quit in the past year and who had been abstinent for three continuous months at the time of the survey increased from 15 percent in 1990 to 20 percent in 1993. In Massachusetts, there was a significant increase in the proportion of light smokers and a significant decrease in the proportion of heavy smokers between 1993 and 1995 (Table 4). The Massachusetts surveys also show a 24 percent reduction in the number of smokers who have their first cigarette of the day within thirty minutes of waking, although this change is not statistically significant.

Prevention of smoking uptake. An important goal of the tobacco control programs is to prevent the initiation of smoking by young people. The 1990, 1992, and 1993 California Tobacco Surveys included a sample of youth between 12 and 17 years of age. The prevalence of current smoking (defined as having at least one cigarette on one or more days in the past month) among adolescents in California remained relatively stable from 1990 to 1993, ranging from 9.1 percent in 1990 to 8.7 percent in 1992, to 9.1 percent in 1993 (Pierce et al., 1994).

Table 3. Selected Indicators of Change in Tobacco Use, ETS Exposure, and Public Attitudes toward Tobacco Control Policies — California, 1990-1993.

	1990	1992	1993
Smoking Behavior			
Percentage of adult smokers smoking >25 cigarettes daily	16.6	15.5	17.3
Percentage of adult smokers smoking <15 cigarettes daily	43.6	43.0	43.2
Percentage of past year's quit attempters who were abstinent for 3 months at time of survey	15.3	18.6	20.2
Environmental Tobacco Smoke Exposure			
Percentage of workers reporting a smokefree worksite	35.0	46.0	65.0
Percentage of nonsmokers exposed to ETS at work	29.0	—	22.4
Percentage of homes in which smoking is banned	—	48.1	50.9
Attitudes toward tobacco control policies			
Support for further increase in tax on tobacco with funds earmarked for tobacco control	—	74.0	78.0

Source: Pierce et al., 1994. Results of statistical tests on differences have not been reported.

Table 4. Selected Indicators of Change in Tobacco Use, ETS Exposure, and Public Attitudes toward Tobacco Control Policies—Massachusetts, 1993–1995.

	1993	1995
Adult Smoking Behavior		
Percentage smoking >25 cigarettes daily	24	10*
Percentage smoking <15 cigarettes daily	31	49*
Percentage smoking within 30 minutes of waking	54	41
Environmental Tobacco Smoke Exposure		
Percentage of workers reporting a smokefree worksite	53	65*
Mean hours of ETS exposure at work during prior week	4.2	2.3*
Percentage of homes in which smoking is banned	41	51*
Attitudes toward tobacco control policies		
Percentage supporting further increase in tax on tobacco with funds earmarked for tobacco control	78	81
Percentage believing ETS is harmful	90	84
Percentage supporting ban on vending machines	54	64*
Percentage supporting ban on support of sports and cultural events by tobacco companies	59	53*

Source: Biener and Roman, 1996.
* $p<.05$

Although Massachusetts included a youth survey in its baseline year (1993), funds were not available to repeat the youth survey in 1995. Data are available, however, from the Massachusetts Youth Risk Behavior Survey (YRBS), a self-administered, school-based survey of students in grades 9–12, directed by CDC (Massachusetts Department of Education, 1996). The prevalence of current (past month) smoking among Massachusetts high school students increased from 30.2 percent in 1993 to 35.7 percent in 1995 (Massachusetts Department of Education, 1996).

Because the age of respondents in the youth component of the CTS (ages 12 to 17) was substantially lower than that of respondents to the Massachusetts YRBS (grades 9–12; ages 14 to 18), and because telephone surveys consistently yield lower estimates of smoking prevalence than self-administered school surveys, the smoking prevalence estimates from the California and Massachusetts surveys cannot be compared. The trends within the two state surveys, however, are consistent. There has been no reduction in smoking prevalence among adolescents in either California or Massachusetts since the onset of the tobacco control programs.

Development of Tobacco Control Policies

Policy development is one of the three major areas of intervention in the National Cancer Institute's model for reducing tobacco use. Stimulating and supporting the development of community policy to reduce tobacco use and protect nonsmokers from ETS exposure is a critical component of statewide tobacco control programs. The MIS in both California and Massachusetts tracks local smoking ordinance and regulation development. In addition, Americans for Nonsmokers' Rights (ANR) maintains a database of local tobacco control ordinances. This database is the only source of comprehensive national data on local tobacco ordinances. Each quarter, ANR solicits information on local ordinances by sending a mailing to individuals and agencies throughout the country. The mailing list includes a designated tobacco control contact person in each state as well as all state departments of health, all ASSIST, IMPACT, and Robert Wood Johnson Foundation Smokeless States program coordinators, nonsmokers' rights groups, voluntary health agencies, and state tobacco control departments. The list of local ordinances was published by the National Cancer Institute in 1989 and again in 1993, and is now released periodically by ANR (1996).

Both Proposition 99 and Question 1 stimulated policy development in local communities in California and Massachusetts. Both interventions were associated with a striking increase in the adoption of local ordinances and regulations regarding tobacco; in particular, these statewide programs stimulated the development and enactment of local 100 percent smokefree workplace and restaurant ordinances and regulations (ANR, 1996; Massachusetts Department of Public Health, 1996) (Figure 3). In fact, nearly all of the local ordinances and regulations in the United States that prohibit smoking in private worksites and restaurants were enacted in California and Massachusetts during the period in which the statewide programs were in effect.

Data from the California and Massachusetts surveys reinforce the findings from the tracking of local ordinances. In each state, the tobacco surveys assessed the existing worksite smoking policy of employed respondents. In both California (Table 3) and Massachusetts (Table 4), there has been a significant increase in the proportion of workers reporting that smoking is prohibited at their workplace.

Proposition 99 and Question 1 also stimulated the development of local policies to restrict youth access to tobacco. In Massachusetts, data from the MIS indicate that from 1993 to 1995, 52 cities and towns enacted laws requiring permits for tobacco retailers. Restrictions on vending machines were adopted in 56 localities, and 37 banned the distribution of free samples of tobacco products. The population covered by such ordinances more than doubled from 1993 to 1995. Results of compliance operations being carried out across the state show a clear reduction in the proportion of underage customers who successfully buy cigarettes. Teen smokers in Massachusetts are more than twice as likely to be asked to show identification when

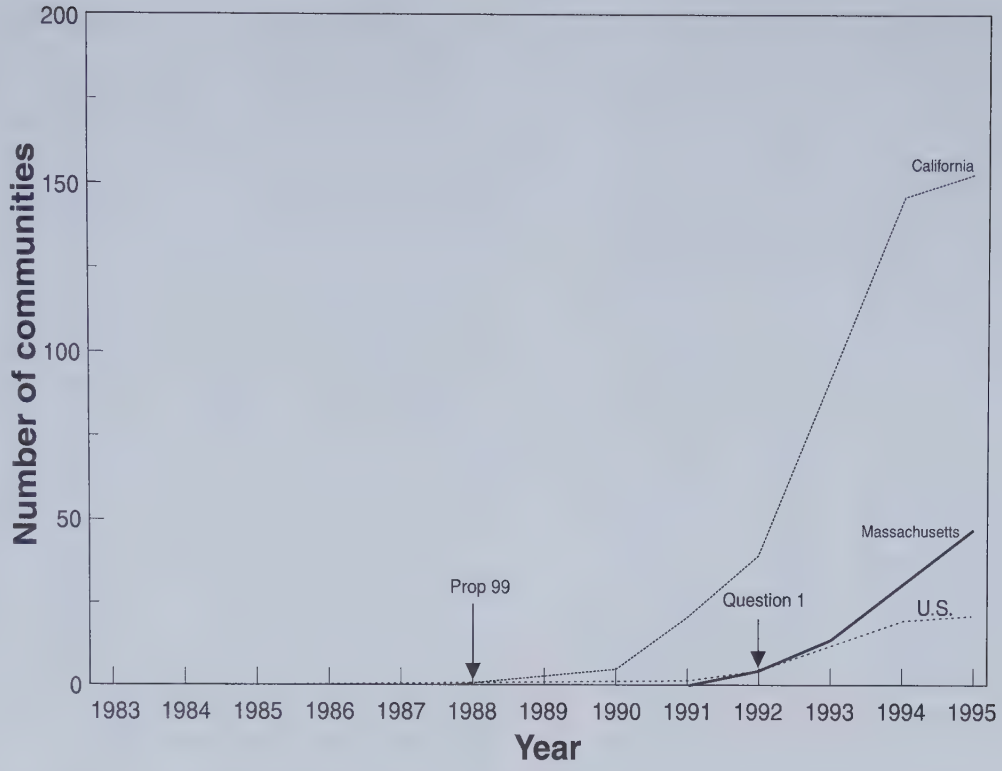

Fig. 3. Cumulative number of communities with 100 percent smokefree workplace and/or restaurant ordinances or regulations, by yera—Massachusetts, California, and the remainder of the United States (excluding Massachusetts and California), 1983–1995.

they try to buy cigarettes in Massachusetts (49 percent) than in the U.S. as a whole (23 percent) (Biener & Hamilton, 1996).

Environmental Tobacco Smoke Exposure

Indicators of exposure to environmental tobacco smoke are available from the CTS and MTS. The California surveys asked nonsmokers whether anyone had smoked in their work area in the week prior to the survey. The Massachusetts surveys asked respondents to estimate the number of hours they were exposed to "other people's tobacco smoke" at work. There were substantial declines in self-reported exposure to ETS at the workplace in both California (Table 3) and Massachusetts (Table 4).

The home may also be an important site for exposure to ETS. The prevalence of household no-smoking policies was assessed in both states. The California surveys show little change from 1992 to 1993 in the proportion of homes in which smoking was not allowed; however, baseline data from 1990 are not available (Table 3). In Massachusetts, there has been a significant increase in the prevalence of smokefree households and a corresponding decrease in the hours of ETS exposure at home (Table 4).

Public Attitudes

Changes in the level of public support for tobacco control policies is an important intermediate goal of community-based interventions. Both the CTS and MTS assess public support for the tobacco control program as well as attitudes towards specific tobacco control strategies. In general, support for tobacco control was high at the start of both programs and little change is apparent (Tables 3 and 4). The one policy area for which support seems to have increased in Massachusetts is restriction of youth access to cigarettes (Table 4). The one policy area for which there was a small but significant decline in support was prohibition of tobacco company sponsorship of sporting and cultural events (Table 4).

Discussion

Statewide tobacco control initiatives present both significant problems for evaluation as well as rich opportunities for learning. The problems emerge from the fact that these initiatives are not randomized controlled trials that permit reasonably definitive conclusions to be drawn about program impacts. In the absence of untreated control groups, questions about effectiveness must rely on examination of time series data, comparison with existing information on comparable states or the nation as a whole, and analyses that examine changes as a function of exposure. All of these designs are less than ideal and can lead to serious errors of interpretation.

For example, although trends in smoking prevalence in California and Massachusetts do not appear markedly different from those in the nation as a whole, one cannot conclude that the interventions had no effect on smoking prevalence, because it is not known what would have happened in the absence of the interventions. Furthermore, changes in smoking behavior in the nonintervention states may be influenced by the California and Massachusetts programs. The statewide tobacco control programs are, in fact, part of a national intervention—they have an impact beyond their state borders. The California program served as a model that enabled Massachusetts to implement a similar intervention; both programs have stimulated efforts to increase cigarette excise taxes in other states. These factors limit our ability to determine the impact of the programs in Massachusetts and California by comparison with national trends.

In spite of the limitations of existing evaluation methods, three conclusions can be drawn about the impact of the tobacco control programs in California and Massachusetts:

- They have resulted in a significant decline in cigarette consumption.
- They have resulted in significant increases in the development of local smokefree workplace and restaurant ordinances and regulations, and, most likely, a consequent reduction in ETS exposure.
- They have not yet brought about a reduction in smoking uptake among adolescents.

It is disappointing to find that the California and Massachusetts programs have apparently not yet succeeded in reducing smoking initiation among adolescents. Some have attributed this failure to the massive and effective advertising and promotional campaigns by cigarette manufacturers. It has also been suggested that the recent focus on reducing youth access by means of vending machine bans, prominent signs regarding minimum age for tobacco purchases, and fines to vendors who sell to minors may be a counterproductive strategy (Glantz, 1996). These methods may increase tobacco's appeal to youth by emphasizing that smoking is for "adults only," thereby reinforcing the tobacco industry's portrayal of smoking as an initiation into the adult world and a symbol of growing up. A more effective route to prevention is to reduce the demand for cigarettes among youth by decreasing the overall prevalence of tobacco use in society. This requires a comprehensive focus that includes, in addition to more effective youth prevention programs, continued emphasis on adult cessation and continued delegitimization of smoking in public.

Our analysis suggests that the statewide tobacco control initiatives in both California and Massachusetts have had a substantial impact on the public's health through reduced tobacco consumption and reduced exposure to second-hand smoke. The California consumption data provide solid evidence of a reduction over

and above what is seen in the nation as a whole. The Massachusetts consumption data seem similarly convincing, and the survey results documenting significant declines in daily smoking rate reinforce the finding. The ANR and MIS data on local ordinances and regulations provide striking evidence of the interventions' effectiveness in stimulating local clean indoor air and youth access policy development. The survey data in both states reinforce the ordinance data by demonstrating a reduction in self-reported exposure to ETS in the workplace. Furthermore, studies have demonstrated that restrictive smoking policies at the workplace (Hammond et al., 1995) and in private homes (Biener et al., 1996) effectively reduce ETS exposure.

The question to be answered now is not *if* these interventions work, but *how* they work. It is clear that the changes in cigarette consumption observed so far are not a result of decreased smoking initiation. There is evidence of a reduction in the amount smoked by current smokers, but there is not yet clear evidence of a dramatic increase in smoking cessation.

In addition to the problems of secular change discussed above, several other factors must be considered in interpreting our findings. First, it takes a long time to change deeply ingrained, addictive behaviors; multiple quit attempts are often necessary before sustained cessation can occur. The dramatic reduction in smoking prevalence observed during the 1970s and 1980s was a result of two decades of relentless campaigning (Susser, 1995). In contrast, the effects examined in this paper have occurred after only three to seven years of program operation.

It also takes a long time to produce the changes in social norms that are necessary for a reduction in smoking initiation to occur. As Susser points out, "to bring about notable change in ingrained behavior and have the change pervade populations, time is needed to ignite and build a social movement at nongovernmental levels." (Susser, 1995, p. 158.) Although both California and Massachusetts have established comprehensive government anti-smoking programs, it is not until these programs ignite a comprehensive movement at the community level that social change, and the prevention of smoking initiation, will occur.

To change health behavior and social norms, especially among youth, society must "provide consistent messages from a variety of sources and over a long period of time" (Austin, 1995, p. 114). The tobacco control programs in California and Massachusetts have not been sustained. In both states, funding for tobacco education and prevention has been gradually eroded by the state legislature, with increasing amounts of the cigarette excise tax revenues being diverted to non-tobacco programs. In California, Governor Wilson and his administration attempted to eliminate the media campaign (Novotny, 1994; Skolnick, 1992; Novotny & Siegel, 1996), forbid the use of an effective 30-second television spot that called attention to the statements of several tobacco company executives that nicotine is not addictive (Glantz, 1996), refused to air a second television spot that criticized the tobacco industry for its refusal to acknowledge the health effects of smoking ("Turning Timid," 1996), and appointed Kim Belshe, a former tobacco

industry lobbyist who lobbied against Proposition 99, as the director of the state Department of Health Services (Delson, 1996). The Wilson administration is now attempting to restrict the use of Proposition 99 funds to programs that focus on youth access to tobacco, forbidding any attacks on the tobacco industry itself (Glantz, 1996; "Turning Timid," 1996; Sherman, in press).

To present consistent messages over time, statewide tobacco control initiatives require a consistent, supportive constituency within state government (Novotny, 1994; Novotny & Siegel, 1996). Without high-level political support, there is uncertainty about the funding of programs from year to year. This uncertainty translates into an inability to conduct long-term strategic planning, to create proactive, rather than reactive interventions, and to empower local communities with the autonomy and confidence necessary to plan and implement the most effective interventions. There has been a lack of consistent, high-level political support for tobacco control in both California and Massachusetts. The legislatures in both states have repeatedly cut program funding. The governors in each state have attempted to eliminate critical elements of the tobacco control programs, most notably, the media campaigns (Novotny, 1994; Phillips, 1995).

It is important to keep in mind that tobacco control interventions do not take place in isolation. The tobacco industry has responded to these campaigns with increasingly aggressive advertising and promotion, especially that which attracts youth (see Pollay, this issue). Tobacco advertising in California still exceeds anti-tobacco advertising by a margin of more than thirty to one (Novotny, 1994).

Recommendations

Our analysis has several major implications for refining the statewide tobacco control programs in California, Massachusetts, and Arizona, and for developing similar interventions in other states. First, constituency groups must exert continuous pressure on the state legislature and administration to ensure full, sustained funding for these voter-mandated programs. To improve the ability of the state and community programs to provide consistent and sustained messages over a long period of time, funding appropriations must be made for longer periods than one year at a time (Novotny & Siegel, 1996).

Second, constituency groups must ensure that political pressure does not weaken the scope and aggressiveness of tobacco control campaigns. To ensure the fidelity of program implementation, funds should be appropriated as directly as possible to communities, which should have the autonomy to implement programs with the oversight and technical assistance, but not the control, of state government. Counter-advertising media campaigns should be designed and conducted independently by advertising firms that have expertise in advertising and marketing, not by government officials who are subject to political pressures.

Third, the public health community must obtain high-level political support for tobacco control. Interventions are unlikely to succeed if public health practitioners spend so much of their time protecting the programs from diversion of funding that they have little time to devote to the practice of tobacco control.

Finally, states must confront the aggressive response of the tobacco industry to their anti-smoking interventions. Changes in political campaign financing may be required to diminish the industry's ability to undermine these interventions by purchasing legislative or administrative support. More aggressive restrictions on tobacco advertising and promotion may be required to diminish the industry's ability to respond to tobacco control interventions by strategic changes in their marketing of tobacco products.

Statewide initiatives that establish comprehensive tobacco control programs funded by cigarette tax revenue have the potential to be the most effective public health interventions available. However, they must be implemented faithfully and in accordance with the will of the voters who have mandated the use of these funds to reduce tobacco use and decrease tobacco-related morbidity and mortality.

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Judicial Approaches to Tobacco Control: The Third Wave of Tobacco Litigation as a Tobacco Control Mechanism

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Tobacco products liability litigation is one of the most potentially effective means of controlling the sale and use of tobacco. Recent factual developments—concerning (1) the addictiveness of nicotine, (2) tobacco industry knowledge of this addictiveness, and (3) the industry's efforts to conceal its knowledge from the public while making its products more addictive—make it unlikely that the tactics used successfully by the tobacco industry in the first (1954 to 1973) and second (1983 to 1992) waves of tobacco litigation will succeed in the third wave of tobacco litigation. Victory in any of these cases would result in a transfer of costs from injured states or individuals to the tobacco industry. Such a transfer of costs would likely have the immediate impact of raising cigarette prices and thereby lowering cigarette consumption. The long-term effects of a victory would probably be much more devastating to the industry.

Tobacco products liability litigation provides one of the most promising means of controlling the sale and use of tobacco. Recent factual developments—concerning: (1) the addictiveness of nicotine; (2) tobacco industry knowledge of this addictiveness; and (3) the industry's efforts to conceal its knowledge from the public while making its products more addictive—and innovative legal devices, strategies, and tactics being employed by plaintiffs' attorneys

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make it unlikely that the tactics used by the tobacco industry to defeat plaintiffs in the first (1954 to 1973) and second (1983 to 1992) waves of tobacco litigation will succeed in the third wave of tobacco litigation. For, unlike the earlier cases, the class actions and medical cost reimbursement suits of the third wave are characterized by a number of factors that enable plaintiffs to overcome the previously impenetrable defenses of the tobacco industry. These include a number of factors that make it easier for plaintiffs' attorneys to present enough evidence to the jury of the tobacco industry's decades-long conspiracy of misinformation and deceit around the issues of the addictiveness of nicotine and the harmfulness of tobacco. This evidence includes: (1) new information garnered from internal industry documents and former tobacco industry researchers and executives concerning tobacco industry knowledge of the addictive and pharmacologic properties of nicotine, industry attempts to hide this knowledge, and industry efforts to manipulate nicotine levels so as to addict smokers; (2) the absence of blameworthy plaintiffs in both classes of cases; and (3) the likely unavailability to the industry of its two favorite affirmative defenses—assumption of the risk and contributory negligence—in the state medical cost reimbursement actions. These new factors also include a number of legal devices, strategies, or tactics designed to circumvent the tobacco industry's abusive discovery practices and to overcome the tremendous resource advantages enjoyed by the industry in previous litigation: (1) the expenditure of time, money, and resources on behalf of thousands or millions of plaintiffs (as opposed to a single plaintiff) in the class action lawsuits; (2) an array of well-financed and well-organized plaintiffs' attorneys sharing resources and information in both classes of cases; and (3) the securing of case management orders in cases brought on behalf of individual plaintiffs. These factors have contributed to some recent successes in getting juries to blame the manufacturer of the instrument of harm—the cigarette—for the injuries caused by it.

Victory in any of the class actions would result in a partial transfer of costs from injured smokers to the tobacco industry. Victory in any of the medical cost reimbursement suits would result in a transfer of costs from injured states forced to shoulder the economic burden of tobacco-induced illnesses to the tobacco industry. Such a transfer of costs would likely have the immediate impact of raising cigarette prices, thereby lowering cigarette consumption.

The amount of exposure faced by the tobacco industry is quite substantial. The annual cigarette-caused medical costs and productivity losses, divided by annual cigarette sales, have been conservatively estimated at $2.17/pack in 1985 dollars (Levoy, 1996). Of course, every affected smoker will not sue, and every meritorious suit will not succeed. On the other hand, the manufacturers have to cover their defense costs as well, and punitive damages may raise some judgments well above the amounts needed for compensation. Furthermore, even a relatively small price increase—such as $.25/pack—will have very significant consumption effects. Price increases of 10 percent have been shown to produce overall consumption

decreases of 4 percent, with 14 percent decreases among males twelve to seventeen years old (Levoy, 1996). Because 50 percent of smokers begin by age fourteen and the great majority by age eighteen (Levoy, 1996), the reductions in smoking by children and teenagers may be the most relevant for cancer control purposes. In any event, the hypothesized $.25/pack, 20 percent price increase would produce long-term reductions of at least 10,000 cigarette-caused cancer deaths annually, and possibly many more (Daynard, 1988).

The long-term effects of victories in the class actions and medical cost reimbursement suits of the third wave would probably be much more devastating to the industry. Third-wave victories may drive home the point about the dangers of smoking, while forcing the industry to stop its deceptive advertising, promotion, and public relations. Finally, materials documenting the industry's disinformation campaign, discovered by plaintiffs' attorneys, may hinder industry lobbying efforts against other anti-smoking strategies. Products liability suits have achieved similar effects with respect to asbestos and other dangerous products (Daynard, 1988).

The First and Second Waves of Tobacco Litigation

Throughout the first (1954–1973) and second (1983–1992) waves of tobacco litigation, the tobacco industry steadfastly maintained that its products were not harmful. Plaintiffs in the first wave of tobacco litigation were, in fact, hampered by the paucity of medical studies establishing the link between smoking and disease (Edell, 1986). This led to difficulties in establishing proximate cause. But even in the second wave of tobacco litigation, when medical studies had firmly established the direct connection between smoking and disease (Edell, 1986), the tobacco industry paradoxically argued with great success that smokers had freely chosen to smoke and had thereby assumed the risks of smoking and negligently contributed to their own harm. The defenses of assumption of the risk and contributory negligence were greatly strengthened by the Federal Cigarette Labeling and Advertising Act's imposition of a warning label on all cigarette packaging and advertising (Federal Cigarette Labeling and Advertising Act, 1994). The result was that, rather than identifying the tobacco industry as the cause of the myriad tobacco-induced illnesses, jurors instead tended to blame plaintiffs who had continued to smoke despite health warnings about the link between tobacco use and disease (Daynard, 1994).

In the first and second waves of tobacco litigation, the tobacco industry also successfully pursued a "king of the mountain" strategy (Daynard, 1994) by taking deposition after deposition, and filing and arguing absolutely every motion it could possibly argue, thus threatening to bankrupt and bloody any plaintiff's attorney. This strategy was succinctly described by J. Michael Jordan, an attorney who successfully defended R. J. Reynolds in the 1980s, in an internal memo to his colleagues:

> The aggressive posture we have taken regarding depositions and discovery in general continues to make these cases extremely burdensome and expensive for plaintiffs' lawyers.... To paraphrase General Patton, the way we won these cases was not by spending all of [RJR's] money, but by making that other son of a bitch spend all his (*Haines v. Liggett Group*, 1993).

The experience of the law firms that pursued the landmark *Cipollone* case is illustrative of what happened in many of the individual lawsuits in the first and second waves of tobacco litigation. Over one hundred motions were filed, and most of the motions were argued. There were also four interlocutory applications, one resulting in the grant of an appeal and the Third Circuit's initial decision on preemption (*Cipollone v. Liggett Group*, 1986), an appeal from the final judgment to the Court of Appeals following a trial of about four months (*Cipollone v. Liggett Group*, 1990), and two petitions for certiorari to the Supreme Court of the United States, one of which was granted resulting in an argument, and then a reargument, before that Court (*Cipollone v. Liggett Group*, 1992). The firms advanced over $500,000 in out-of-pocket expenses and approximately $2,000,000 in lawyer and paralegal time in connection with the *Cipollone* trial, and over $150,000 in out-of-pocket expenses and over $900,000 in attorney and paralegal time in post-trial proceedings (*Smith v. R. J. Reynolds*, 1994).

The *Cipollone* trial had eventually resulted in a $400,000 verdict which was overturned by the Third Circuit on various technical grounds (*Cipollone v. Liggett Group*, 1986), and the case was remanded for trial (*Cipollone v. Liggett Group*, 1990). A trip to the United States Supreme Court strengthened the plaintiff's case (*Cipollone v. Liggett Group*, 1992), but the law firms representing the estate of Rose Cipollone—faced with the loss of hundreds of thousands of dollars—withdrew from the case before it went to trial (*Smith v. R. J. Reynolds*, 1994).

Overview of the Class Actions and Medical Cost Reimbursement Lawsuits of the Third Wave

Any discussion of the third wave of tobacco litigation must begin with an overview of the class actions and medical cost reimbursement lawsuits that comprise it. The third wave of tobacco litigation began in March 1994 with the decision of a Florida appellate court in *Broin v. Philip Morris Companies, Inc.* (*Broin v. Philip Morris*, 1994) and the filing of *Castano v. The American Tobacco Company* in federal court in Louisiana (*Castano v. American Tobacco*, 1994). The class members in *Broin*, which was filed on October 31, 1991, are nonsmoking flight attendants who assert that they are suffering from diseases and disorders caused by their exposure to second-hand smoke emitted from passengers' cigarettes (*Broin v. Philip Morris*, 1991). *Castano v. The American Tobacco Company* was filed on March 29, 1994, in federal court in Louisiana (*Castano v. American Tobacco*, 1994). Like Engle, the plaintiffs' claims in *Castano* focus on defen-

dants' intentional manipulation of the levels of nicotine, known to them to be a hazardous and addictive substance.

On May 23, 1996, a three-judge panel of the United States Court of Appeal for the Fifth Circuit ("the Fifth Circuit") concluded that the United States District Court for the Eastern District of Louisiana ("the District Court") erred in certifying *Castano v. American Tobacco Company* as a class action. Had it been allowed to proceed, *Castano* probably would have been the largest class action in this nation's history. The Fifth Circuit decided, however, that the District Court ignored "variations in state law and how a trial on the alleged causes of action would be tried" when it certified *Castano*. The Fifth Circuit also stated in its opinion that it did not want a single jury to decide the fate of the entire tobacco industry. Deciding that the errors could not be corrected on remand "because of the novelty of plaintiffs' claims," the Fifth Circuit panel vacated the District Court's certification order and remanded the case with instructions that the District Court dismiss the class complaint (*Castano v. American Tobacco*, 1996).

Plaintiffs' lawyers will now pursue Plan B and file statewide class actions in state courts around the nation. The fate of the tobacco industry will now be decided by scores of juries all across the nation (Kelder, 1996c). Four of the statewide class actions that have been filed in the wake of the decertification of *Castano* are modeled after the *Castano* case (see, e.g., *Scott v. American Tobacco*, 1996) and are being pursued by attorneys who were involved in the *Castano* lawsuit.

The plaintiffs in *Engle v. R. J. Reynolds Tobacco Company*, filed on May 5, 1994, base their eight-count complaint on the assertion that the defendant tobacco companies and their agents knew that nicotine was addictive, claimed unceasingly that it was not, and made every effort to suppress scientific and medical evidence of nicotine's addictiveness (*Engle v. R. J. Reynolds*, 1994). The plaintiffs' claims focus on the defendant's intentional manipulation of the levels of nicotine in their tobacco products so as to make them addictive, while concealing information about the addictive nature of nicotine (*Engle v. R. J. Reynolds*, 1994).

The wave of state reimbursement suits was initiated on May 23, 1994, when Mississippi Attorney General Mike Moore filed an unprecedented lawsuit against the tobacco industry on behalf of the state's taxpayers to recoup Mississippi's share of the Medicaid costs necessitated by tobacco-induced diseases. Rather than proceeding in a trial court on a theory of subrogation (whereby the State would have stood in the shoes of injured smokers), Moore chose to proceed in equity (i.e., before a single judge in a nonjury proceeding) on theories of unjust enrichment and restitution. Moore's equity claims were grounded in the notion that the State of Mississippi had been injured directly by the behavior of the tobacco industry because Mississippi's taxpayers had been forced to pay the state's Medicaid costs due to tobacco-related illnesses (*Moore v. American Tobacco*, 1994).

As of September 11, 1996, fourteen other states had filed medical cost reimbursement suits: Minnesota, West Virginia, Florida, Massachusetts, Louisiana,

Texas, Maryland, Washington, Connecticut, Kansas, Arizona, Michigan, Oklahoma, and New Jersey (Kelder, 1996a). The premise upon which all of the other medical cost reimbursement lawsuits are based is the one initially put forward in the Mississippi suit: that the tobacco industry should pay for the staggering health care costs caused by its tortious conduct. Several of these other lawsuits have unique and significant characteristics or marked "firsts" in this wave of litigation; however, all share the goal of recovering costs to the states incurred by tobacco-related diseases. Other states are likely to file medical cost reimbursement lawsuits in the near future. More than thirty states were represented at a Tobacco Products Liability Project conference sponsored by the Robert Wood Johnson Foundation in November 1995. A similar number appeared at a follow-up meeting in Chicago on May 3, 1996.

Factors Contributing to the Success of Third-Wave Tobacco Liability Lawsuits

New Evidence

A series of revelations of tobacco industry knowledge of the addictive and pharmocologic properties of nicotine and of tobacco industry efforts to manipulate nicotine levels to addict smokers has uncovered facts that tend to absolve users of tobacco products of responsibility for their addiction and place the onus squarely on the industry. The third wave of tobacco litigation was sparked by an FDA letter and a television investigative report. On February 25, 1995, FDA Commissioner David Kessler, M.D., J.D., relying primarily on a document discovered in the *Cipollone* case, sent a letter to the Coalition on Smoking Or Health reporting that the FDA had received "mounting evidence" that "the nicotine ingredient in cigarettes is a powerfully addictive agent" and that "cigarette vendors control the levels of nicotine to satisfy this addiction." (Kessler, 1994.) He suggested that these conclusions, if established in an administrative or judicial proceeding, would justify regulating cigarettes as a drug and ultimately banning tobacco products "containing nicotine at levels that cause or sustain addiction." (Kessler, 1994.)

On February 28, 1994, the ABC broadcast news magazine "Day One" ran an exposé on tobacco industry manipulation of nicotine levels in tobacco products to addict smokers. A second "Day One" story about the secret list of cigarette ingredients ran on March 7, 1994. Philip Morris responded by suing ABC in state court in Richmond, Virginia, (giving Philip Morris the "home court" advantage) for libel, claiming that the program cost the company $5 billion in lost revenue.

The ABC reports and Dr. Kessler's public statements prompted Representative Henry Waxman (D-CA), then-chairman of the Health and Environment Subcommittee of the House Energy and Commerce Committee, to hold a series of nationally televised hearings on nicotine manipulation and other tobacco industry practices. At the March 25, 1994 subcommittee hearing on nicotine manipulation, FDA Com-

missioner Kessler testified that many modern cigarettes are "high-technology nicotine delivery systems" (Regulation of Nicotine-containing Tobacco Products, 1994). During the course of this and subsequent appearances before the subcommittee, Dr. Kessler testified about the use of genetically engineered, nicotine-enhanced tobacco in U.S. cigarettes, tobacco industry patenting of techniques for nicotine manipulation, and secret industry research on the pharmacological effects of nicotine (Regulation of Nicotine-containing Tobacco Products, 1994). At the April 14, 1994 subcommittee hearing on nicotine manipulation, seven tobacco CEOs testified under oath that they believed nicotine is not addictive and that smoking has not been shown to cause cancer (Daynard, 1994). The subcommittee's hearings resulted in the release of damaging internal industry documents (Barnes et al., 1995b).

The pursuit of the tobacco industry continued on into the spring of 1994 when, due to the continuing efforts of investigative journalists and others, internal Brown & Williamson Tobacco Company (B&W) documents were leaked to the press. On May 7, 1994, the *New York Times* ran a front-page story on the leaked documents, and this was followed by stories in the *Wall Street Journal*, *USA Today*, the *Washington Post,* and a host of other newspapers (Gottlieb, 1994). The documents indicate that B&W had studied nicotine for years, that its internal stance on several issues related to smoking and health differed from what it was telling the public, that it had, but withheld, findings about the addictiveness of nicotine and the health dangers of both smoking and environmental tobacco smoke, and that B&W attorneys were involved in the management of research projects (Gottlieb, 1994).

Since the genesis of the third wave of tobacco litigation in the spring of 1994, revelations about the tobacco industry's knowledge of the harmfulness of smoking and the addictiveness of nicotine continued to surface in the form of: (1) Philip Morris documents indicating that the company's researchers had studied and written about the pharmacological effects of nicotine on smokers (Collins and Hilts, 1995); (2) an analysis of the documents obtained by B&W and B&W's parent, British American Tobacco Company (BATCO) (Barnes et al., 1995b); (3) R. J. Reynolds Tobacco Company documents obtained by investigative journalists (Levy, 1995); (4) the November 1995 deposition testimony of Dr. Jeffrey Wigand, B&W's former vice president for research (*Moore v. American Tobacco*, 1996); and (5) sworn statements given to the Food and Drug Administration (that were first made public on March 18, 1996) in which three former Philip Morris employees said that Philip Morris not only believes it is in the nicotine-delivery business but controls nicotine levels in its brands (Uydess Statement, 1996; Rivers Statement, 1996; Farone Statement, 1996). Dr. Uydess's statement includes the following comment:

> Tobacco companies like Philip Morris learned a long time ago, that it was hard to get people to stay with a good tasting product if the nicotine level was too low. . . . Philip Morris clearly understood . . . that they could develop a market for a medium to high nicotine product that

> had marginal taste, but that they would have trouble sustaining the sales of a good-tasting product that was too low in nicotine (Uydess Statement, 1996).

Similar statements were made by Dr. William A. Farone, former director of applied research at Philip Morris, and Dr. Jeffrey Wigand, former Brown and Williamson vice president for research. In addition, the contents of internal R. J. Reynolds Tobacco Company documents leave no doubt that R. J. Reynolds knew of the addictiveness of nicotine (Levy, 1995).

The series of revelations described above has generated a new set of facts that can be used by plaintiffs pursuing the cases of the third wave of tobacco litigation. Over the course of the last three decades, the tobacco industry repeatedly had made representations that (1) nicotine is not pharmacologically active, addictive or harmful, and (2) the industry does not manipulate nicotine levels in its products so as to addict or maintain the addiction of consumers. The recent evidence makes clear, however, that the industry was well aware of the pharmacologically active, addictive, and harmful nature of its products, and that it took active steps to hide this information from its customers and the public at large. These revelations indicate that the tobacco industry does manipulate nicotine levels in its products so as to addict or maintain the addiction of consumers (cf. Barnes et al., 1995b).

The FDA concluded in the findings it published in the *Federal Register* on August 11, 1995, that the Council for Tobacco Research (CTR) does substantial research on nicotine's pharmacological effects on the brain (Nicotine in Cigarettes, 1995) and that CTR personnel have revealed their knowledge that nicotine is a psychoactive drug (Nicotine in Cigarettes, 1995). CTR was, in fact, looked upon by the industry as a source of information about the industry's knowledge of nicotine's addictiveness and techniques for manipulation of nicotine levels (Nicotine in Cigarettes, 1995). The FDA's findings also indicate that at least some of the industry's nicotine research was shared among tobacco companies (Nicotine in Cigarettes, 1995).

The industry has also claimed that there is no definitive proof that smoking causes diseases such as cancer and heart disease. Yet, the documents show that, by the 1960s, B&W and BATCO had proven in their own laboratories that cigarette tar causes cancer in laboratory animals (Barnes et al., 1995b). Finally, the industry has claimed that it is committed to determining the scientific truth about the health effects of tobacco both by conducting internal and by funding external research. The B&W-BATCO documents indicate that, rather than conducting objective scientific research, B&W attorneys have been involved in the selection and dissemination of information from internal as well as external scientific projects for decades (Barnes et al., 1995a). The industry misrepresented the work of the CTR as objective scientific research on smoking and health, while funneling research through attorneys to gain the protection of attorney-client privilege. The documents also include descriptions of how to dispose of damaging documents held by the company's research department (Barnes et al., 1995a).

Dr. Jeffrey Wigand also charged that B&W in-house lawyers repeatedly hid potentially damaging scientific research and altered minutes of scientific meetings. Dr. Wigand testified that J. Kendrick Wells, Brown & Williamson's assistant general counsel, routinely stamped sensitive scientific research "confidential" or "attorney/client work product," even though it had not specifically been created for preparation or use in litigation. Dr. Wigand also testified that, following a meeting of top scientists from B&W and its affiliates in Vancouver, British Columbia, in 1989, Mr. Wells eliminated roughly twelve pages of the meeting's minutes. Wigand said that the missing pages detailed "the company's research on a safer cigarette and on nonaddictive nicotine alternatives" (Freedman, 1996; *Moore v. American Tobacco*, 1996).

Shortly after the 1989 Vancouver meeting, Wigand testified that he was summoned to Mr. Sandefur's office and told "there would be no further discussion or efforts on any issues related to a safer cigarette." Wigand also testified that Mr. Sandefur told him "that there can be no research on a safer cigarette. Any research on a safer cigarette would clearly expose every other product as unsafe and, therefore, present a liability issue in terms of any type of litigation." Wigand also asserted that top company officials insisted that coumarin, a compound found in rat poison, remain as an additive in pipe tobacco, even though Wigand told them he was concerned about its safety (Freedman, 1996; *Moore v. American Tobacco*, 1996).

The Absence of Blameworthy Plaintiffs and Subsequent Loss of the "Assumption of Risk" Defense

What all of the cases of the third wave of tobacco litigation have in common, and what will distinguish them in the minds of jurors from the previous two waves of litigation, is the absence of a blameworthy plaintiff. Although addiction had been argued previously, what is new about *Engle* and the statewide successors to *Castano* is the argument that the secret manipulation of nicotine levels by the tobacco industry so as to better addict smokers removes any blame from the plaintiffs and places it squarely on the defendants. It is also unlikely that jurors will blame the nonsmoking flight attendants in *Broin* for having continued to work in smoky airplanes.

The most obvious and undeniable absence of blameworthy plaintiffs occurs in the state medical cost reimbursement actions. The tobacco companies won many of the first- and second-wave cases by asserting the defenses of assumption of risk and contributory negligence, or by asserting that the smoker's willfulness, not the industry's misbehavior, was the proximate cause of the smoker's smoking and consequent illness. Proving assumption of risk in a lawsuit against the tobacco industry generally consists of showing that the injured smoker, knowing the dangers and risks involved in smoking, chose to smoke anyway, and proving contributory negligence generally consists of showing that, by smoking, the injured smoker breached

his or her duty to protect him- or herself from injury, and thereby contributed to the harm suffered. These defenses should not be available to the tobacco industry in medical cost reimbursement suits, because these suits are not brought on behalf of injured smokers. They are brought, instead, on behalf of the states themselves to recover the medical costs they have been forced to pay to care for indigent smokers. The tobacco industry cannot plausibly argue that the states chose to smoke or that they contributed to the harm caused them by tobacco products.

The Expenditure of Time, Money, and Resources on Behalf of Thousands or Millions in the Class Action Lawsuits

The great advantage of the class actions being pursued in the third wave of tobacco litigation is that resources are expended on behalf of thousands or millions of class members rather than on behalf of a single individual. This provides more of a level playing field and means that the tobacco companies will not be able to successfully pursue their usual first- and second-wave strategy of forcing opponents to spend exorbitant sums of money until, nearly bankrupted, they are forced to withdraw. In its unanimous decision, the appellate court in *Broin*, after considering and rejecting defense objections to plaintiffs' request for class certification, alluded to the great promise that the class action strategy holds for plaintiffs challenging the tobacco industry:

> if we were to construe the rule to require each person to file a separate lawsuit, the result would be overwhelming and financially prohibitive. Although defendants would not lack the financial resources to defend each separate lawsuit, the vast majority of class members, in less advantageous financial positions, would be deprived of a remedy. We decline to promote such a result (*Broin v. Philip Morris*, 1994).

Whereas a national class action whose class contains many members from many different states may be unjustly criticized as being unmanageable because of its vast size, and because it may involve conflicts over which states' legal standards should be used to decide the case, statewide class actions, such as *Engle* and the cases filed thus far in the wake of the demise of *Castano*, are immune from such criticisms. Statewide class actions will be more manageable, and state courts won't have to reconcile the laws of different states.

The class action strategy is alive and well. What's changed post-*Castano* is that the tobacco industry will not have to face a single class action of gigantic proportions. The industry will instead face scores of huge statewide class actions. Plaintiffs now have more forums in which they might win. Time, money, and resources will now be expended, not on behalf of a national class action composed of some 50 million plaintiffs, but on behalf of statewide classes composed of thousands or hundreds of thousands of plaintiffs. In large states like California and New York, the classes may be composed of millions of plaintiffs. Like *Castano*, all of these state-

wide cases will be more cost-effective and, thus, easier to pursue than the individual cases in the first and second waves were. The tobacco companies will not be able to win these statewide classes by attempting to bloody and bankrupt the plaintiffs' attorneys who dare to challenge them as they did in the first and second waves of tobacco litigation.

This is, in part, due to an array of well-financed and well-organized plaintiffs' attorneys sharing resources and information. Chief among the cases being prosecuted by extremely well-organized and well-financed attorneys was the *Castano* case (*Castano v. American Tobacco*, 1994). The class was represented by a consortium of more than 60 law firms from across the United States, most of which had pledged $100,000 per year in support of the litigation. Although the *Castano* case was decertified, the attorneys in the *Castano* consortium have $2.2 million on hand, and $1.5 million comes into the consortium every three months as each of the sixty firms involved antes up. These are the attorneys who will be leading the charge in the statewide class actions in state courts (Kelder, 1996c).

The states that have thus far filed medical cost reimbursement suits have at their disposal the financial resources of their respective states. In several states, outside counsel has advanced the costs of attorney time and expenses on a contingent fee basis. In Minnesota, Blue Cross-Blue Shield has joined the state as a co-plaintiff and is covering out-of-pocket expenses plus a contribution to attorney time. In Massachusetts, Blue Cross and Blue Shield is contributing generously to out-of-pocket expenses (Kelder, 1995).

The attorneys involved in all of these suits are also sharing information with one another on an unprecedented scale. On May 28, 1996, the United States Supreme Court, without comment, left intact a Minnesota Supreme Court ruling that the tobacco industry must turn over to the plaintiffs in Minnesota's medical cost reimbursement suit the computer databases that comprise an index to millions of internal industry documents obtained in the suit. The databases could provide to the plaintiffs' attorneys pursuing the myriad cases of the third wave of tobacco litigation the precise tool they require to proceed quickly and efficiently with discovery and information-gathering in their respective lawsuits (*Philip Morris v. CIR*, 1996).

The databases' index could save plaintiffs' lawyers research time and speed, thus making it easier and more economical for plaintiffs to develop and prove their cases. The databases, which provide a guided tour to the documents, will make it easier for plaintiffs' attorneys to find the proverbial needle in the haystack because the databases allow plaintiffs to have a list of needles. Estimates are that, without the databases, it would take nine years for five attorneys working twelve hours a day, five days a week, to sort through the documents.

The Securing of Case Management Orders in Cases Brought on Behalf of Individuals

As discussed more fully above, one way to circumvent the tobacco industry's "king of the mountain" strategy is to pursue class actions which are more cost-effective because money is expended in these cases on behalf of thousands or millions of plaintiffs as opposed to a single plaintiff. A second legal device that can be used to circumvent the tobacco industry's "king of the mountain" strategy is a case management order that places limits on discovery and sets time standards for the conduct of cigarette cases.

On January 23, 1996, the Circuit Court for Duval County, Florida, issued a case management order that "applies to all cigarette injury cases presently filed and filed in the future by the law firm of Spohrer, Wilner, Maxwell, Maciejewski, & Stanford, P.A. in Duval County Circuit Court, Duval County, Florida" (*In re: Cigarette Cases*, 1996). The case management order sets time standards, places limits on discovery and allows for the expedited elevation of backup cases to primary status when a case scheduled for trial is dismissed (*In re: Cigarette Cases*, 1996). The case management order dictates that cases are identified as cigarette injury cases as soon as they are filed. They are then assigned sequentially to one of the circuit court's eight divisions so as to evenly distribute the number of cases pending in each of these divisions. The eight divisions then rotate so that each month one of them will provide a trial setting for cigarette cases. In the division whose turn it is for that month, there will be one cigarette injury case identified as the primary trial case for that month. A cigarette trial list will then provide for a sequenced list of backup cases that are ready for trial (*In re: Cigarette Cases*, 1996). That means that if the primary case is dismissed, continued, or for other reasons cannot be tried, the first backup case will be tried. The short of it is that if the tobacco industry's "king of the mountain" strategy succeeds in knocking out the primary case, a backup case will be tried.

The case management order also calls upon the parties to prepare a uniform discovery and pretrial order providing for consistent standards in discovery practice, including timely disclosure of witnesses and exhibits (*In re: Cigarette Cases*, 1996). This means that the tobacco industry will not be able to abuse the discovery process—filing any and every motion and burying its opponents in paper—as it has often been accused of doing in cases filed against it in the past.

The Carter Case as Emblematic of a New Paradigm in Tobacco Litigation

The factors discussed above form a new paradigm through which the tobacco industry and smoking will be seen by jurors, judges, the public, and government in the third wave of tobacco litigation (Daynard & Kelder, 1995). The tobacco companies will no longer be seen as honest purveyors of a legal and perhaps harmless recreational substance that some individuals develop the habit of using. They will be

seen, rather, as the dishonest pushers of a drug called nicotine, a substance that they recognized as harmful and addictive over thirty years ago. They will be seen as shameless frauds who deliberately deceived the public into believing that their product was safe and nonaddictive, while conspiring to keep the industry's knowledge to the contrary secret, manipulating the levels of nicotine in its products so as to better addict the users of nicotine, and targeting young women, children and minorities in its advertising campaigns in order to addict a new generation of nicotine users to replace those who died from the consequences of their addiction. This new paradigm should result in jurors blaming the tobacco industry, rather than smokers, for the harm smokers have suffered at the hands of cigarettes.

A recent Florida case is emblematic of this new paradigm and the results it is likely to produce. On August 9, 1996, a six-person jury in Jacksonville, Florida, awarded a verdict of $750,000 to Grady Carter, a former air traffic controller who smoked from age seventeen in 1947 until he was diagnosed with lung cancer in 1991, and his wife, Mildred Carter, who sued Brown & Williamson Tobacco Co. in 1995 on the grounds of negligence and strict liability. This was the first jury to decide a case in the third wave of tobacco litigation, and the first jury in a tobacco products liability case to have presented to it the damning information contained in the Brown & Williamson internal documents. In so ruling, the jury found that the Lucky Strike cigarettes manufactured by Defendant Brown & Williamson Tobacco Corporation, as successor by merger to the American Tobacco Company, were "unreasonably dangerous and defective." In contrast, on August 23, 1996, an Indiana jury found four cigarette makers were not responsible for a long-time smoker's cancer death. After sixteen hours of deliberation, a Superior Court jury rejected the claims by Yvonne Rogers that four tobacco companies sold products that were defective to her husband, Richard (Daynard et al., 1996).

Although the tobacco industry would like the press and the public to view the plaintiffs' victory in *Carter v. American Tobacco* as an "aberration" and the plaintiff's loss in *Rogers* as confirmation of that view, comparing *Carter* to *Rogers* is like comparing the proverbial apples to oranges. *Rogers*—a case filed back in the second wave of tobacco litigation—is typical of the individual cases of the second wave, in that no internal industry documents were admitted into evidence and no special techniques were used to overcome the abusive discovery tactics of the tobacco industry. Despite these facts, the real truth of the matter is that the tobacco industry would have lost the *Rogers* case, too, had it not been for a peculiarity of Indiana law that prevents juries from ruling for plaintiffs if plaintiffs bear more than 50 percent of the blame for their injuries. This is not the law in most states. *Carter* is typical of the new breed of cases of the third wave of tobacco litigation. The *Carter* jury was exposed to the damaging facts contained in the Brown & Williamson documents, and the lawyers prosecuting the *Carter* case on behalf of the plaintiffs used the previously described technique of securing a case management order to short-circuit the abusive discovery tactics of the tobacco industry (Daynard et al., 1996).

The *Carter* victory—only the third instance in which an American jury has ever awarded damages to a plaintiff in a cigarette products liability case—should, in fact, be seen as ushering in a new era in tobacco litigation in which the tobacco industry will be held accountable for its misdeeds. The first ever damages award—$400,000 to the family of Rose Cipollone—was overturned by the Third Circuit on various technical grounds. The second damages award came on August 31, 1995, when a California state court jury awarded $2 million—$1.3 million in compensatory damages and $700,000 in punitive damages—to Milton J. Horowitz, a 72-year-old university professor, clinical psychologist and former smoker, who claimed his mesothelioma was caused by the asbestos contained in the Micronite filter in the Kent cigarettes he used to smoke. Lorillard was held liable for a $1.21 million share of the damages and Hollingsworth & Vose, the manufacturer of Kent's Micronite filter, was assigned a share of $790,000 (Daynard et al., 1996).

The true significance of the *Carter* verdict lies in the fact that Norwood "Woody" Wilner and his colleagues at Spohrer, Wilner, Maxwell, Maciejewski & Stanford, P.A. have shown attorneys all across the nation the way to win an individual cigarette products liability action against the tobacco industry. The keys are: (1) the use of some sort of legal device, strategy or tactic to circumvent the tobacco industry's abusive discovery practices; and (2) to present enough evidence to the jury of the tobacco industry's decades-long conspiracy of misinformation and deceit around the issues of the addictiveness of nicotine and the harmfulness of tobacco, so that the jury blames the tobacco company rather than the smoker for the injuries caused.

The admission of the Brown & Williamson documents into evidence in the *Carter* trial played a key role in Woody Wilner's victory. According to an article published by the *Wall Street Journal* on August 12, 1996, the first jury to see the Brown & Williamson documents assigned those documents a key role in their decision:

> In interviews over the weekend with three of the six jurors, two expressed anger over the internal documents and all three complained about a key contradiction in the company's defense. Brown & Williamson produced reams of evidence suggesting Mr. Carter was aware smoking was harmful but, at the same time, the company vehemently insisted the perils of smoking aren't proved. "To me, it boiled down to two words, crass hypocrisy," says Samuel Gaskins, 60, a retired postal-service supervisor, who served as jury foreman. "They can't have it both ways" (Hwang et al., 1996).

The impact that internal industry documents such as the Brown & Williamson documents can have on juries is underscored by the fact that in *Cipollone*, the only other case to make substantial use of industry documents, the jury awarded the plaintiff $400,000. The documents in *Cipollone* included evidence that: Liggett & Myers (L&M) knew by the early 1970s how to make a safer cigarette, but suppressed it, for fear that implicit in marketing it would be the admission that L&M's other cigarettes were unsafe; Philip Morris had identified a wide variety of carcinogens and co-carcinogens in cigarette smoke by the early 1960s, but kept mum; and

Lorillard had concluded in 1946 that the published evidence justified a "presumption" that smoking causes lung cancer, but did nothing to inform or protect its customers (Daynard et al., 1996). The jury in *Rogers* did not get to see the kind of damning evidence to which the *Cipollone* and *Carter* juries were exposed.

Future plaintiffs' attorneys can avail themselves of the Brown & Williamson documents, the Philip Morris documents, the R. J. Reynolds documents, and the testimony of whistle blowers like Jeffrey Wigand and Ian Uydess. They can also copy the innovative tactics of Woody Wilner and secure a case management order like the one in *Carter*. In the end, the verdicts in *Carter* and *Rogers* demonstrate that the tide is turning against the tobacco industry.

Conclusion

The new paradigm discussed at length above may lead to the "catastrophe" that proves to be the undoing of the tobacco industry. As happened with asbestos, litigation against the tobacco industry may come to consist of tens of thousands of cases. The major tobacco companies would then have to retain counsel in every large city in the United States, fresh liability insurance would probably become unavailable to them, and their financial statements would reflect the kind of contingent liabilities that frighten most prudent investors (Daynard, 1988).

In fact, the third wave of tobacco litigation has already resulted in one landmark settlement. On March 15, 1996, the State of West Virginia, the State of Florida, the State of Mississippi, the Commonwealth of Massachusetts, and the State of Louisiana (collectively, "Plaintiffs" or "the Settling States"), entered into an agreement with Brooke Group Ltd. ("Brooke Group"), a Delaware corporation, and Liggett Group, Inc. ("Liggett"), a Delaware corporation, to settle the Brooke Group/Liggett portion of these states' medical cost reimbursement actions (Shao, 1996). This settlement represents a breach in the tobacco industry's previously impenetrable defenses. The tobacco industry is no longer presenting a united front in the face of the third wave of tobacco litigation. This is also an extraordinary development because the industry is very proud of its unbroken record of the last forty years of never settling or never paying out a penny in damages to plaintiffs. This means that the multiparty strategy of the third wave of tobacco litigation has achieved its first victory. If Liggett is the fault line, the third wave's multiparty strategy is the geological pressure that caused the earthquake that this settlement represents.

The August 9, 1996 defeat of the tobacco industry in *Carter v. American Tobacco* and the promulgation of the FDA's recent final rule on tobacco have led to discussion of a global legislative settlement of all tobacco litigation. The *Wall Street Journal* reported on August 26, 1996, that Trent Lott, the man who succeeded Bob Dole as Senate Majority Leader, has agreed to broker a global legislative proposal that would allow the tobacco industry to avoid FDA regulation and grant cigarette

manufacturers sweeping immunity from products liability suits for the next decade and a half (Freedman & Hwang, 1996). According to the *Journal*,

> Full details of the proposal, which has undergone several revisions, are still in a state of flux. But the latest draft calls for the tobacco industry to pay $6 billion in 1997, with the sum escalating to about $10 billion in the fourth year and continuing over the next 11 years. About 95 percent of the money, which would be administered by a presidential-appointed administrator, would be paid out in grants to the nation's 50 states. The money would be used to partially reimburse the states for the cost of treating smoking-related ailments as well as to fund tobacco-control programs and to provide some individual compensation for sick smokers (Freedman & Hwang, 1996, p. A2)

The plan also requires the industry to drop any lawsuits it has brought against industry defectors and whistle blowers (Freedman & Hwang, 1996).

In exchange for this, the industry would gain immunity from virtually all liability suits for the next fifteen years. The exception would be class-action or individual suits already under way, but they would have a damages cap imposed upon them. The tobacco industry would also escape FDA regulation of nicotine as a drug and cigarettes as drug delivery devices, but the FDA's current recommendations would be enacted into law (presumably by Congress). The *Journal* also reported that "if youth smoking rates fail to decline by 50 percent within a certain period of time, jurisdiction would revert back to the [FDA]" (Freedman & Hwang, 1996, p. A2).

The proposal raises serious questions for the public health: Does it represent the successful realization of the tobacco control goals of tobacco litigation or does it fall short of these goals?

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Suggestions for the Creation and Implementation of Tobacco Policy

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When making policy suggestions regarding tobacco use, it is important to consider why tobacco use has proved such a difficult behavior to eradicate. The articles in this issue have identified a number of variables that we would be well served to consider when creating tobacco policy. First, tobacco use has been difficult to eradicate because of the addictive nature of nicotine. Even though many smokers wish to quit, the addictive nature of the product makes this difficult. A second variable that compounds this problem is that tobacco addiction typically begins in adolescence. The decision-making process used by adolescents that may lead to tobacco use may be particularly difficult to alter, thus making smoking initiation a difficult process in which to intervene. Finally, it is important to consider the political power of the tobacco industry and to identify promising methods of overcoming this power when creating policy. These might include innovative legal strategies and searching for compromises that can reduce tobacco use while protecting important tobacco constituencies.

How should our society deal with tobacco products? That such products pose a threat to the public health is beyond doubt. Nevertheless, the sale of tobacco products remains a very profitable business. Despite the health risks, many individuals choose to begin smoking, and to continue to smoke. How has the tobacco industry maintained profitability in the face of the overwhelming body of data regarding the dangers of tobacco? The articles in this issue have identified a number of variables that may contribute to the relatively stable position of tobacco in our society. I will now review some of the variables that have been discussed in the preceding articles,

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and propose some potential strategies for overcoming them and reducing the prevalence of tobacco use.

Factors Relating to the Continued Profitability of Tobacco Products

One key factor in the continuing profitability of tobacco is the addictive nature of the product. A wide array of data lead to the conclusion that nicotine produces an addiction syndrome similar to a number of other drugs (see Heishman, Kozlowski & Henningfield, this issue; Henningfield, Cohen & Slade, 1991). This addictiveness may contribute to the difficulty many smokers have when attempting to quit. Some data suggest that up to 70 percent of adult smokers would like to quit (Centers for Disease Control, 1994). Yet at any given time only 10–15 percent of these smokers are currently prepared to progress into the action phase of a quit attempt (Prochaska, DiClemente, & Norcross, 1992). Furthermore, only 3 percent of all quit attempts end in abstinence for one year (Centers for Disease Control, 1994). Thus, despite the known dangers of tobacco, smokers who want to give up their habit have a very difficult path to follow if they are to achieve abstinence from tobacco.

Another factor contributing to the continued popularity of tobacco products is the typical cycle of use. The vast majority of adult tobacco users began using tobacco products as adolescents (USDHHS, 1994). The impact of information regarding the long-term physical risks of tobacco use may be viewed as less important than proximal factors by these individuals when they are making the decision to begin use of tobacco products (Hine et al., this issue). Thus, a decision with long-term implications is typically being made without adequate consideration of those implications. Once an individual is at a point in life at which long-term implications are given more weight, he or she may already be in the grasp of nicotine addiction, making the cessation attempt more difficult and less likely to succeed.

A final factor that makes the reduction of tobacco use a much more difficult task to accomplish is the economic, and hence, the political clout wielded by the tobacco industry. Tobacco interests have been very successful in using this clout to minimize the effectiveness of efforts to reduce tobacco use. Efforts to restrict tobacco products in any way have been met with strenuous efforts to oppose such restrictions. In states facing votes on anti-tobacco amendments, the tobacco industry has poured huge sums of money into ad campaigns designed to sway voters against the initiative. The industry also has attempted to reduce the likelihood of such political action by making campaign contributions to virtually any and all candidates running for Congress or the Senate. Legislators who feel indebted to the tobacco industry may be less likely to push for anti-tobacco legislation. Furthermore, by providing financial support to community pro-smoking groups around the country, the tobacco industry has facilitated a grass roots opposition to the anti-tobacco movement. Finally, the tobacco industry has attempted to generate sym-

pathy for the individuals who earn their livelihood through the tobacco industry (Altman, Levine, Howard & Hamilton, this issue). With each of these tactics, and others, the tobacco industry has successfully utilized its political power and made the reduction of tobacco use a more difficult task.

Potential Strategies for Overcoming These Problems

The addictiveness of nicotine, the adolescent onset of tobacco use, and the political opposition provided by the tobacco industry have each placed a potential roadblock in the path of individuals concerned with the public health who have worked to reduce the prevalence of tobacco use. However, by identifying the factors that may inhibit our ability to reduce tobacco use, we may be able to identify some potential windows of opportunity. If we know why tobacco has been such a difficult opponent, we may be able to target specifically the areas that make it so.

Targeting youth tobacco use. A crucial variable in the creation of any coherent anti-tobacco strategy must be the inclusion of techniques to reduce the adolescent use of tobacco. This is crucial for two reasons. First, it seems likely that if adolescent tobacco use could be reduced, there would be a corresponding reduction in the number of adult smokers. Data suggest that relatively few tobacco users initiate their habits as adults (USDHHS, 1994). Therefore, it seems likely that reducing the number of adolescents who use tobacco products will lead to less use in this cohort as they become adults. Second, programs specifically targeted toward adolescent tobacco use present political problems for the tobacco industry. It is not politically expedient for the tobacco industry to appear to want adolescents to begin smoking. Although the evaluation of tobacco advertisements and marketing strategies suggests that the adolescent market is crucial to the industry (Pollay, this issue), to admit so publicly and to oppose measures designed to reduce adolescent tobacco use would create too much political backlash. Therefore, programs designed to reduce adolescent tobacco use may provide a rare opportunity to propose and enact anti-tobacco initiatives with limited opposition from the tobacco industry.

There are a number of strategies that would serve to encourage the reduction of adolescent use of tobacco products. The recently enacted FDA initiatives provide a step in the right direction. These regulations limit the kind of advertising that can be used by the tobacco industry in youth-oriented magazines, and restricts the location of billboards advertising tobacco products to areas away from schools. In addition, the regulations attempt to make the purchase of tobacco products more difficult for minors. Though potentially helpful, these measures stop short of what could be done to limit adolescent tobacco use. Furthermore, Glantz (1996) has argued that attempting to reduce youth access to tobacco may backfire by making the product more appealing to adolescents. Therefore, rather than focusing on youth access, it may be useful to focus on youth demand. Restricting the advertisements available to

youth markets is one method that may reduce demand. Another potentially useful strategy in this regard may be to increase taxes on tobacco products. As noted by Seigel and Beiner (this issue), statewide initiatives using increasing tobacco tax revenues to create tobacco reduction programs have met with some success. In addition, price increases in tobacco products have been shown to reduce consumption (Hu, Sung, & Keeler, 1995; Wasserman et al., 1991). It seems reasonable to suggest that this may be particularly true among adolescents, whose discretionary income is typically scant at best. Another potentially useful strategy may be to offer smoking cessation programs in schools to go along with the prevention programs already in place. Some smokers who initiate tobacco use at age thirteen or fourteen do want to quit by age seventeen or eighteen. Unfortunately, however, these individuals typically do not have access to smoking cessation programs. Providing such programs through the schools may produce some beneficial modeling effects as well: As younger adolescents see older adolescents attempting to quit smoking, they may be persuaded not to take up the habit.

Acknowledging and addressing the political clout of the tobacco industry. At least part of the continuing success of the tobacco industry must be attributed to its savvy use of political power. The industry has expended a great deal of time and money to protect its interests, and it has done so with great success. Activists on the other side of the tobacco fence would do well to acknowledge this political savvy, and seek ways to diffuse it rather than taking it on directly.

One potential method of diffusing this political power would be, as mentioned earlier, to target adolescent tobacco use. Opposing efforts to reduce youth access to tobacco is, from the standpoint of the tobacco industry, a politically risky position at best and political suicide at worst. A second strategy for diffusing the industry's political power would be to consider compromises that will protect the tobacco constituency. The industry has generated sympathy for its position by citing the economic hardship that will be experienced by tobacco farmers and others in the tobacco industry if smoking were to be significantly reduced. If anti-tobacco legislation and initiatives could include components that would help farmers develop alternative crops, this may decrease the resistance to such legislation (see Altman et al., this issue). A third method of reducing tobacco's political clout may be to use creative litigation strategies (Kelder & Daynard, this issue). One way in which the industry has wielded its power has been to expend huge amounts of money in any liability case brought against it (hence substantially increasing the legal costs of the plaintiffs and the plaintiffs' attorneys). By seeking case management guidelines that reduce the ability of the industry to use these tactics, plaintiffs attorneys may be able to remove one weapon from the tobacco industry's arsenal of economic and political power.

Conclusion

To this point, the tobacco industry has focused the debate over tobacco on whether tobacco is a harmful product. This recently has included the generation of debate regarding the dangers of ETS and the addictive nature of nicotine. It is time for the public health side of the debate over tobacco to start setting the agenda rather than letting the tobacco industry set the agenda. We need to stop arguing about the effects of tobacco and start identifying ways that we can successfully reduce the use of this harmful product. In order to successfully set the agenda it is important to take a broader perspective that allows us to evaluate why tobacco use has remained so high, and to target our resistance specifically to these areas. If we allow ourselves to get caught up in a debate with tobacco industry loyalists about whether ETS is harmful or whether nicotine is addictive, we have, to some extent, allowed the tobacco industry to achieve its goal. On the other hand, if we shift our focus to identifying which areas of the tobacco industry's opposition may be vulnerable, we may be better able to target these vulnerable areas and move forward toward the goal of reducing tobacco use and increasing the public health.

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Introduction of the 1995 Kurt Lewin Memorial Award Recipient: Marilynn B. Brewer

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University of South Florida

It is my great pleasure to introduce Dr. Marilynn Brewer, Regents Professor of Psychology at the Ohio State University and this year's recipient of the Kurt Lewin Memorial Award. This award is given annually by the Society for the Psychological Study of Social Issues to an individual whose career and professional achievements reflect the values and ideals of Kurt Lewin. It was the judgment of the 1995 committee members, Peggy Clark, Jack Dovidio, and myself, that Dr. Brewer is an extremely appropriate recipient of this award. But, before I tell you about Dr. Brewer, I want to briefly discuss some aspects of Kurt Lewin's life, some of his contributions to social issues and action research, and the origins of this award. Then I will tell you about Marilynn Brewer and some of the reasons why we chose her for this award.

Kurt Lewin was born in 1890 in Germany. He received his Ph.D. from the University of Berlin in 1914, working under Carl Stumpf. Lewin was a patriotic German who served in the army during the first World War and received an Iron Cross for his bravery in combat (Schultz & Schultz, 1996). But as Nazis gained power in Germany, Lewin, who was Jewish, realized that he must leave his native land. In 1933, Lewin wrote to Wolfgang Kohler, "I now believe there is no other choice for me but to emigrate, even though it will tear my life apart." (Cited in Benjamin, 1993, pp. 158, 160.) Lewin left for the United States shortly thereafter, but his mother and sister remained in Germany and died in concentration camps.

Lewin began teaching in America at Cornell University in 1933, but after two years he left Cornell to take a position at the University of Iowa, where he stayed for ten years. Although today we see Kurt Lewin as perhaps the major figure in the shaping of contemporary social psychology, his friend, colleague, and biographer Alfred Marrow pointed out (1969) that during Lewin's lifetime his scientific efforts were not necessarily well received by his professional colleagues. Lewin's aca-

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demic appointments were, for the most part, unusual—the school of Home Economics at Cornell and the Child Welfare Station at the University of Iowa. Marrow also notes that it was not until 1947, the year of Lewin's death, that any organization officially recognized his enormous contributions. That organization was SPSSI, which honored Lewin by establishing the award that Dr. Brewer is receiving today, the Kurt Lewin Memorial Award.

Most social psychologists know about the Center for Group Dynamics, which Lewin established at MIT in 1945, but they may not be aware that he was also establishing a private organization in New York City at the same time he was establishing the Center. It was called the Commission on Community Relations, the CCI. This organization was supported by the American Jewish Congress, but Lewin's goals and aspirations for the CCI went beyond his lifelong struggle against anti-Semitism. Lewin saw the CCI as a vehicle that would carry out action research on "problems that confronted people who were engaged in fighting prejudice." (Marrow, 1969, p. 191.) Further, according to Marrow (1969), Lewin believed that the "CCI's responsibility would not end with finding out what methods work; it also had to be concerned to see that its results were put into action." (p. 191).

One of the three research priorities Lewin set for the CCI was to identify what conditions of contact between " . . . people from different groups, . . . result in an improvement of attitudes and in harmonious relationships and what conditions bring about the converse. . . ." (cited in Marrow, 1969; p. 192). This question to which Kurt Lewin devoted so much of his time and effort is also one of the major focuses of Dr. Brewer's long and distinguished career. And her work on the social psychology of intergroup relations is the major, although certainly not the only reason, why we are honoring her today.

Marilynn Brewer was born, raised, and educated in Chicago, Illinois. In 1968 she earned her doctorate in social psychology from Northwestern University. I know that Marilynn will speak about this in her talk, but I would be remiss if I did not mention that her major professor was Donald Campbell, who, sadly, died recently. Campbell, like Lewin, was someone who turned his genius as a theoretician and researcher to the causes and cures of important social issues.

Dr. Brewer left Chicago in 1973 to take a position at the University of California, Santa Barbara; nine years later she was appointed Professor of Psychology and Director of the Institute for Social Science Research at UCLA. Then, in 1993, she moved closer to her Midwestern roots by becoming a Regents Professor of Psychology at the Ohio State University in Columbus, Ohio.

Like Lewin, Dr. Brewer has contributed a great deal to the organizations that share her goals and aspirations for the discipline of psychology. Perhaps most relevant to today's award, Marilynn is a past president of SPSSI, but she is also a past president of the Society for Personality and Social Psychology, the Western Psychological Association, and more recently, the American Psychological Society. She was an associate editor of *Social Cognition* and is the current editor of a new journal

published by the Society for Personality and Social Psychology, *The Personality and Social Psychology Review*. Marilynn's colleagues have already formally recognized some of her contributions to social psychology by giving her the Donald T. Campbell Award for Distinguished Research in Social Psychology in 1992.

Today we also recognize and honor her for her research contributions, especially those that address intergroup relations and the reduction of intergroup conflict. This topic has been one of the primary focuses of Dr. Brewer's research efforts for almost thirty years. The second article she ever published was on determinants of social distance in East African tribal groups (Brewer, 1968). Since then, she has written three books that have dealt directly with intergroup relations and edited a series on the causes and consequences of ethnocentrism. Her other books and chapters on methods and evaluation research have also been of enormous value to those who want to learn how to conduct meaningful and useful research on complex and difficult real world problems.

As a teacher of social psychology and as someone who studies ethnic, gender, and racial prejudice, I have long been a fan of Marilynn Brewer's research on intergroup conflict and prejudice. It is, of course, intellectually sophisticated and theoretically coherent, but my admiration for her work is based on something else. She and her students and colleagues seem to have a special talent for taking complex and abstract concepts from the messy world outside the laboratory and translating them into meaningful and construct valid operations within the laboratory. This produces two major benefits for other researchers and lay people interested in the reduction of intergroup conflict. The first is the enormous contribution that her research has made to basic theory, which can be used to better understand social problems such as ageism, ethnocentrism, sexism, and racism. For example, her seminal work on ingroup bias (Brewer, 1979) and her theory of Optimal Distinctiveness (Brewer, 1991) have each had substantial impact on empirical research on intergroup relations for several years. The second and perhaps more subtle benefit, comes from the methodological brilliance of her experiments. Often in our attempts to study complex social phenomena under highly controlled conditions, we lose the essence of these phenomena as they actually exist outside the laboratory. However, after reading one of Marilynn's studies, I always feel that I have learned something of value to an applied action researcher interested in reducing racial and ethnic conflict. That is, Marilynn has been able to bridge the gap between good laboratory research and action research on social issues.

Outside the laboratory, Marilynn believes in putting her thoughts into action. She does more than bemoan the problems that confront society and the discipline of psychology. She works constructively and effectively with her colleagues to solve these problems. She is an action researcher in every sense of the phrase. It is these kinds of contributions that make Marilynn Brewer such a deserving recipient of the Kurt Lewin Memorial Award. She has demonstrated, to paraphrase Lewin, that there is nothing so practical as a brilliant theorist, an enormously talented experi-

mentalist, and a good politician. It is a real privilege to present this award to Marilynn Brewer on behalf of SPSSI and to express our gratitude for a distinguished career devoted to the psychological study of social issues and to the solution of the problems that confront contemporary society.

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The Social Psychology of Intergroup Relations: Can Research Inform Practice?

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In the four decades since the 1954 Brown v. Board of Education of Topeka desegregation decision, social psychologists have generally avoided direct involvement in policy making in the arena of intergroup relations. A review of research and theory on the social psychology of intergroup relations since the 1960s is used to argue that it is time to renew such involvement. In recent years, policy making in the United States has shifted from assimilationism to various forms of pluralist or multicultural politics. This paper suggests that the route to multiculturalism may be perilous unless better informed by relevant social psychological research.

In 1991 the city of Dubuque, Iowa, was receiving considerable media attention in the United States for a controversial experiment in intergroup relations. Although Dubuque had only a tiny racial minority of 331 black residents scattered among its 58,000 residents, the city had been shocked by a cross-burning in 1989 that ignited a black family's garage. In response to this incident, Dubuque's city council established a task force of business leaders and school and city officials to review the situation and make recommendations for preventing future incidents of racial conflict in the city. Based on the idea that greater exposure to minority groups promotes tolerance, members of the task force concluded that Dubuque needed more minority citizens.

In May, 1991, the city council adopted a plan involving a system of incentives for local businesses to hire minorities, particularly blacks, with the goal of

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*Author's Note: This article is based on the 1996 Kurt Lewin Memorial address presented at SPSSI's 60th Anniversary Convention in Ann Arbor, Michigan, on May 31, 1996. The presentation was dedicated to the memory of Kurt Lewin and of Donald T. Campbell, who inspired my lifelong interest in the study of intergroup relations.

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recruiting to Dubuque twenty new black families a year over the next five years. Even before the plan could be implemented in any meaningful way, the idea of an influx of black residents produced widespread reactance. Racial fights in the local high school and additional cross-burnings ensued. Rumors about the recruitment plan and its effect on local jobs, housing, and safety in the streets spread rapidly. Graffiti containing racial epithets appeared, and a group of young males organized a local chapter of the National Association for the Advancement of White People.

As the turmoil in Dubuque reached the news, the question arose as to what social psychologists had to say about the causes of racial tension in Dubuque, and the probable outcomes of the city council plan to increase minority presence. How do we answer such questions? Certainly it is not that social psychology has little to say about this situation. On the contrary, perhaps in a sense, we have too much to say! Understanding prejudice and intergroup conflict invokes virtually every area of social psychological inquiry—including the study of person perception, social attitudes, aggression, self-esteem, social comparison, equity, cooperation and competition, conformity and compliance, and group identification. Further, the study of prejudice crosses all our levels of analysis, from intraindividual to interpersonal to intergroup processes.

Research and Practice: Why the Gap?

From research in all of these areas, social psychologists have a wealth of relevant information about the cognitive and motivational underpinnings of stereotypes and attitudes toward social groups, about ingroup bias in intergroup perception, about effects of category-based expectancies on interpersonal encounters, and about the consequences of intergroup contact. Yet, in policy debates on issues of intergroup hostility, social psychological perspectives are less accessible than they should be. In recent years, findings from basic social psychological research have not been effectively linked to practice or public policy in the arena of intergroup relations.

The prevailing gap between research and practice is sometimes explained as a function of the fundamental differences between abstract theory that guides basic research and the highly contextualized realities of social problem solving and policy making. But the reasons go beyond this difference in epistemological base. At least two factors associated with the intellectual climate of social psychological research on intergroup relations also contribute to the gap between research and practice.

The first factor is the presence of research enclaves that have hindered the development of integrative theory in this area of research. The social psychological study of intergroup relations for a long time has been characterized by relatively encapsulated research traditions (Brewer, 1994). Table 1 provides one possible taxonomy of the different domains of research and theory that bear on our understanding of intergroup relations. The rows and columns of this table reflect two pervasive distinctions in what is being studied and how.

Table 1. Research Traditions in the Study of Intergroup Relations

	Level of Analysis	
	Individual/Interpersonal Processes	Group Processes
Cognition	–stereotyping	–social categorization –social identity
Affect/Attitudes	–prejudice/racism –unconscious evaluation	–intergroup contact
Behavior/Discrimination	–ingroup favoritism –aversive racism	–institutional racism –collective action

(adapted from Brewer, 1994)

Separate lines of research differ, first of all, in their level of analysis. Like most of social psychology, the study of intergroup relations can be differentiated into work that focuses on intraindividual and interpersonal processes on one hand, and work that focuses on the level of the group or social category on the other. Probably a majority of the research conducted within social psychology on issues of intergroup relations deals with intraindividual phenomena (beliefs, attitudes, and emotions toward social groups or group members) or with interpersonal interactions between individuals who are members of different social categories. Separate research traditions focus on the study of collective behavior, or on intergroup situations in which participants define themselves as representatives of their respective social groups.

Cross-cutting this distinction in levels of analysis are differences in whether the focus of study is on cognition, affect, or behavior. Different research traditions can be distinguished in terms of their emphasis on (1) the categorization and information-processing mechanisms that underlie the cognitive representations of social groups and group members, (2) the assessment of evaluative attitudes and affect toward specific groups, or (3) the behavioral manifestations of interpersonal and intergroup discrimination. Each of these components of intergroup phenomena has been studied at both the individual and the collective levels of analysis.

Research in the six different categories represented by the cells of Table 1 has been highly encapsulated, with little or no cross-citation or conceptual linkages among them. (A volume edited by Zanna & Olson, 1994, represents one exception to this pattern of research isolation. Contributions to this volume were presented at a symposium designed to bring together researchers from the domains of group cognition, social attitudes, and intergroup behavior for the purpose of cross-fertilization and synthesis.) In recent years there have been attempts to reconcile cognitive and affective processes (e.g., Mackie & Hamilton, 1993) and to link these to racial policy attitudes (e.g., Pettigrew & Meertens, 1995), but the chasm between research on individual and group level phenomena remains largely unbridged.

A second contributing factor to the gap between basic research and practice is that scientifically oriented social psychologists have developed a strong reluctance to enter directly into policy arenas. The prevailing sentiment appears to be that it is our job to report our findings in published outlets, and it is up to those who wish to put those findings into practice to read the literature and draw appropriate conclusions. The translation from research to practice is left up to the policymakers themselves, often with a great deal of mistranslation along the route. If we feel misunderstood and underrecognized in the policy arena, it may be because we have failed to meet policy makers halfway in drawing out the implications of our research and theory.

A Call to Action: The Contact Hypothesis

The last time social psychologists got deeply involved in intergroup relations policy in this country was the well-known social science statement that was submitted as part of an amicus brief to the Supreme Court in the *Brown v. Board of Education of Topeka* case which resulted in the 1954 ruling on school desegregation.

The social psychologists who wrote the 1953 statement (most of them SPSSI members, working in the Lewinian tradition of action research) argued against the "separate but equal" doctrine, claiming that segregation inevitably perpetuates prejudice and discriminatory outcomes for Negro children. Their arguments were grounded in the so-called "contact hypothesis"—the idea that prejudice and hostility are fed by separation and unfamiliarity, and that under the right conditions (i.e., equal-status, cooperative, and personalized interactions), intergroup contact reduces prejudice and conflict.

Since the 1950s, at least one line of experimental research in the social psychology of intergroup relations has continued to be directed by the contact hypothesis and its derivatives. During the 1980s, one advance toward a more integrative theory of intergroup relations was achieved when contact research was combined with concepts of social categorization and social identity theory to provide a theoretical framework for understanding the cognitive mechanisms by which cooperative contact is presumed to work (see Miller & Brewer, 1984; Hewstone & Brown, 1986; Hewstone, 1996). The theoretical perspective rests on two basic premises: (1) Individuals organize their understanding of the social world on the basis of categorical distinctions that transform continuous variables into discrete classes; categorization has the effect of minimizing perceived differences within categories and accentuating intercategory differences (Tajfel, 1969); and (2) Since individual persons are themselves members of some social categories and not others, social categorization carries with it implicit ingroup-outgroup (we-they) distinctions; because of the self-relevance of social categories, the ingroup-outgroup classification is a superimposed category distinction with affective and emotional significance (Turner, 1985).

These two premises provide a framework for conceptualizing any social situation in which a particular ingroup-outgroup categorization is made salient. In effect, the theory posits a basic intergroup schema with the following characteristic features: (a) assimilation within category boundaries and contrast between categories, such that all members of the ingroup are perceived to be more similar to the self than members of the outgroup (the intergroup accentuation principle); (b) positive affect (trust, liking) selectively generalized to fellow ingroup members but not outgroup members (the ingroup favoritism principle); (c) intergroup social comparison associated with perceived negative interdependence between ingroup and outgroup (the social competition principle).

The affective and behavioral consequences of this schema lead to intergroup situations characterized by preferential treatment of ingroup members, mutual distrust between ingroup and outgroup, and intergroup competition. From this social categorization perspective, the issue to be addressed is how intergroup contact and cooperation can be structured so as to alter cognitive representations in ways that would eliminate one or more of the basic features of the negative intergroup schema.

Decategorization: The Personalization Model

One model derived from this perspective was based on the idea that contact will be most effective if interactions are highly personalized rather than category-based (Brewer & Miller, 1984). A primary consequence of categorization is the depersonalization of members of the outgroup. Social behavior in category-based interactions is characterized by a tendency to treat individual members of the outgroup as undifferentiated representatives of a unified social category. This perspective on the contact situation suggests that intergroup interactions should be structured so as to reduce the salience of category distinctions and to promote opportunities to get to know outgroup members as individuals. Attending to personal characteristics of group members not only provides the opportunity to disconfirm category stereotypes, it also breaks down the monolithic perception of the outgroup as a homogeneous unit (Wilder, 1978). In this scheme, the contact situation encourages attention to information at the individual level that replaces category identity as the most useful basis for classifying participants.

Evidence for the effectiveness of personalized interactions with outgroup members is provided by results of laboratory experiments with artificial ingroup-outgroup categorizations that have been created in the experimental context. In this research paradigm, participants are first divided arbitrarily into two separate social categories based on the ostensive results of some psychological test. Following this ingroup-outgroup category induction, participants from both categories engage in a cooperative team task which is structured so as to minimize or encourage personalized interactions in the course of cooperative contact. Post-interaction evaluations

indicate that those who interacted under more personalized conditions showed significantly less ingroup bias at the end of the contact experience than those who interacted under more impersonal or category-based conditions (Bettencourt et al., 1992; Miller, Brewer & Edwards, 1985).

Recategorization: The Common Ingroup Identity Model

A second model of intergroup contact was also based on the premise that ingroup bias is most difficult to overcome when ingroup-outgroup distinctions are highly salient. The "Common Ingroup Identity Model" (Gaertner et al., 1993) suggests structuring the contact situation so as to focus attention on superordinate category identification that encompasses both ingroup and outgroup in a single social group representation.

According to the Common Ingroup Identity Model, one reason that superordinate goals are effective in reducing intergroup hostility is that they minimize attention to category differences by creating a new inclusive group identity. When such a superordinate category is made salient, group members are more likely to think of themselves as "one unit," rather than two separate groups.

Original ingroup-outgroup distinctions become less salient when both groups are included in a new ingroup that encompasses previously separate groups. When this form of recategorization is successful, ingroup loyalties and concern for collective welfare are transferred from the original subgroups to the new social category as a whole.

The recategorization model has been tested in a series of experimental studies to assess the conditions under which two previously segregated workgroups can be successfully merged in a superordinate unit. The experimental manipulations in these studies have focused on situational variables that enhance or reduce the perceptual salience of subgroup identities during the combined work team experience. Symbolic features such as group names and colors, or seating patterns that influence proximity and who interacts with whom, have been varied to control relative salience (Gaertner et al., 1989). Consistently, conditions that enhance the salience of the common team identity and reduce the salience of subcategory identities are found to diminish or eliminate ingroup bias in evaluation of fellow team members. To the extent that participants perceive the combined team as a single entity, rather than as an aggregate of two separate groups, evaluations of former outgroup members become more positive (Gaertner et al., 1989; Gaertner et al., 1990).

These two models (decategorization and recategorization) are not mutually exclusive—a common ingroup identity also provides conditions for individuation and personalization of fellow group members. Together these two processes provide a conceptual framework for understanding the qualifying conditions of the contact hypothesis. Cooperation and superordinate goals promote formation of common identity; equal-status, personalized interactions promote decategoriza-

tion and individuation. These models also provide a basis in social psychological theory and research for the melting pot, assimilationist approach to public policy in multiethnic societies.

Failures of Implementation: Science Versus Policy

Given the theoretical and experimental support for the effectiveness of cooperative contact, policy recommendations based on these models seemed well founded. But implementation in real-world settings proved to be a different matter. Reviews of field research on the outcomes of desegregation were mixed, at best (Cook, 1985), and a prevailing belief arose that social scientists were in over their heads when they presumed to recommend that contact was the answer to problems of intergroup conflict and discrimination. As the complexities of intergroup contact in the real world revealed conflict and resistance to cooperative integration, social scientists have had to ask themselves whether failures of implementation reflect inadequate theory or inappropriate policies.

Human Nature and Ethnocentrism

Social psychologists can always legitimately claim that the conditions of contact were rarely "right" (that the qualifications of the contact hypothesis were rarely fully met), but this represents something of an oversimplification of the problems of desegregation. What we have to recognize is that decategorization and common identity—as appealing as these concepts are—are inherently limited in their applicability when we move from the laboratory to real-life situations in which social groups are very large and the context is highly politicized (Rich, Kedem, & Shlesinger, 1995).

One reason for the apparent disjunction between results of laboratory experiments and implementations in the field is that the cognitive theory underlying the two models fails to take into account the functions that differentiated group identities serve in large societal contexts. Social psychology (and liberal philosophy in general) has not given sufficient attention to the fundamental aspects of human nature that give rise to ingroup formation, ingroup attachment and loyalty in the first place. When individuals are willing to fight and die for the sake of preserving group distinctions, we know there must be something more than cognitive representations at stake. Group identification has motivational and functional origins that are deeply rooted in our evolution as a social species.

One account of the motivational underpinnings of social identity is the theory of "optimal distinctiveness" (Brewer, 1991). This model posits that humans are characterized by two opposing needs that govern the relationship between the self-concept and membership in social groups. The first is a need for assimilation and inclusion, a desire for belonging that motivates immersion in social groups. The

second is a need for differentiation from others that operates in opposition to the need for immersion. As group membership becomes more and more inclusive, the need for inclusion is satisfied but the need for differentiation is activated; conversely, as inclusiveness decreases, the need for differentiation is reduced but the need for assimilation is activated. According to the model, the two opposing motives produce an emergent characteristic—the capacity for social identification with distinctive groups that satisfy both needs simultaneously—the need for inclusion/belonging is met within the ingroup, and the need for differentiation by distinctions between ingroup and outgroups. In order to engage member identification and loyalty, groups must have clear rules of inclusion and exclusion.

The process of social identification represents the perceptual, affective, and cognitive mechanisms that support the development and maintenance of group membership and collective behavior. But because successful groups must be exclusive as well as inclusive, the processes that generate social cooperation and sacrifice for the collective welfare within distinctive groups are not extended to those outside the group boundaries. This gives rise to what Campbell (1982) calls "clique selfishness"—where selflessness on behalf of ingroups is matched by the most selfish extremes of greed and hostility when ingroup interests are pitted against those of outgroups. Thus, collective identity also begets ethnocentrism and other manifestations of ingroup bias.

The term "ethnocentrism" was coined by William Graham Sumner in his book *Folkways* (1906). The concept was driven by the observation that human social arrangements are universally characterized by differentiation into ingroups and outgroups—the we-they distinctions that demarcate boundaries of loyalty and cooperation among individuals. Attitudes and values are shaped by this ingroup-outgroup distinction in that individuals view all others from the perspective of the ingroup.

During the 1960s, anthropologist Robert LeVine and social psychologist Donald Campbell undertook an ambitious collaborative effort to test the universality of ethnocentric perception cross-culturally (LeVine & Campbell, 1972). Experienced ethnographers in field sites in Africa, New Guinea, North America, and Asia were commissioned to use their best local informants to obtain information on precolonial ingroup organization and intergroup attitudes, using a structured, open-ended interview format. Both qualitative and quantitative analyses of coded interview responses confirmed the robustness of the tendency to differentiate the social environment in terms of ingroup-outgroup distinctions and to value ingroup characteristics over those of other groups (Brewer, 1972, 1986; Brewer & Campbell, 1976).

While the cross-cultural study of ethnocentrism project of Campbell and LeVine was still underway, Henri Tajfel's social psychology research group in Bristol, England, was developing a very different paradigm for studying ingroup bias and intergroup discrimination in the laboratory. The experiments that Tajfel

and his colleagues conducted involved the so-called "minimal intergroup situation" (Tajfel, 1970), in which participants were divided into arbitrary social categories in the absence of any shared experience, interdependence, or face-to-face interaction. The results of these experiments demonstrated the powerful effects of mere classification of individuals into distinctive categories to produce ingroup preferences and other symptoms of ethnocentrism.

Remarkably, results of the cross-cultural field research and these laboratory studies converged in confirming the power of we-they distinctions to produce differential evaluation, liking, and treatment of other persons depending on whether they are identified as members of the ingroup category or not. Further, the laboratory experiments with the minimal intergroup situation demonstrated that ingroup loyalty and bias do not necessarily depend on bonds of kinship or extensive shared history among group members, but can apparently be engaged readily by symbolic manipulations that imply shared attributes or common fate. What appears to be critical for ingroup favoritism is that there be a basis for distinctive identification of who is "us" and who is "them"—a rule of exclusion as well as inclusion.

The functional basis for this universal ingroup-outgroup differentiation effect may be its critical role in regulating interpersonal trust. In order to reap the benefits of coordinated, cooperative social living, individuals must be willing to trust that their own cooperation will be matched by others'. But to the extent that cooperation, such as food-sharing, giving aid, etc., involves costs to the self, trust produces a dilemma (Brewer, 1981; Kramer, Brewer & Hanna, 1996). Deciding to trust creates both opportunity and vulnerability. The opportunity lies in the gains that accrue when acts of trust are matched by others. The vulnerability derives from the potential costs of misplaced trust when one person extends cooperation which is exploited by others who do not cooperate in return. The fear of misplaced trust reduces the probability that the benefits of mutual cooperation will be achieved.

The trust dilemma is resolved under conditions of reciprocity, where there is some kind of contingency between our cooperative behavior (tit-for-tat). But reciprocity is an interpersonal solution that requires a history of interactions between two individuals, with opportunity to build up a trust relationship. This form of reciprocity does not readily extrapolate to the multiperson group situation where cooperation between any two specific group members may occur only once in a great while and trust must be extended to the collective as a whole. Common group membership and shared group norms provide the equivalent of reciprocity at the group level. Group punishment of failure to adhere to cooperative obligations toward fellow group members creates a kind of "reciprocity pact" among all members of the group. But this coordination requires mutual recognition of shared membership that can extend only so far across time and space. To accomplish this, group size must be delimited and group boundaries must be sufficiently distinct to differentiate who is in from who is not. Thus, successful intragroup cooperation requires exclusion as well as inclusion.

In effect, shared ingroups represent bounded communities of reciprocal trust and cooperation. Within those boundaries, individuals can legitimately expect to receive (and to give) positive regard, aid, and predictability in the form of adherence to shared social norms and rules—expectations that are not extended to those outside the boundary. Trust within and distrust between is the rule of intergroup behavior (Schopler & Insko, 1992). This differential trust gives credibility to the universal ethnocentric belief syndrome. Within such a bounded system, it is not surprising that we learn to think of ingroups as more virtuous than outgroups. This analysis of the functions served by ingroup-outgroup distinctions provides some basis for understanding the deep resistance that is often manifest in response to intergroup assimilation, integration, or mergers.

The Swing to Pluralism: Some Public Policy Dilemmas

As real-world experience and results of our own research have given us more respect for the importance of ingroup differentiation and identification to individual and societal functioning, many social psychologists have abandoned the promise of assimilation and have advocated an alternative model for regulating intergroup relations in which group differences are made more rather than less salient (Fowers & Richardson, 1996). The idea is that distinct group identities can be complementary and mutually respected, and that positive interdependence among groups can be promoted by capitalizing on their distinctive attributes.

This pluralist model is also derived from social identity theory (Hewstone & Brown, 1986) and has been supported by experimental laboratory research on intergroup contact (e.g., Deschamps & Brown, 1983; Van Oudenhoven, Groenewoud, & Hewstone, 1996). In order to promote positive intergroup attitudes, Hewstone and Brown (1986) recommend that the contact situation be structured so that members of the respective groups have distinct but complementary roles to contribute toward achieving common goals. In this way, both groups can maintain positive distinctiveness within a cooperative framework. In the public policy arena, this model resembles the arguments for multiculturalism and pluralism.

Unfortunately, "multiculturalism" has many different meanings and, just as civic leaders in Dubuque were a bit overzealous in their application of principles of contact and assimilation, policymakers are applying multicultural concepts in ways that may well cause much more harm than good in the long run. The perils appear when multiculturalism is understood to mean the preservation of existing category distinctions which are then transported into legal policies and institutions in ways that require codifying what constitute culture groups and protected cultural practices and heritage, and then institutionalize these as the basis for allocation of political power and resources.

Among the many reasons for concern about pluralistic policies and entitlements of this sort, there are at least five issues that are related to social psychological processes.

First, institutionalizing cultural differences in the political arena reduces opportunities for common group identification and individuation, both of which have repeatedly been demonstrated to reduce ingroup bias and discrimination. Politicized pluralism encourages monolithic perceptions of cultural groups with little room for recognition of within-group individual differences.

Second, such policies of necessity privilege particular lines of differentiation among society members that correspond to ethnic groups (as currently defined). Because of the privileged status implied, other interest groups seek definition as "cultures" (e.g., we now speak of gay culture, of deaf culture, and of gender as culture). Because these are usually ascribed rather than achieved social group memberships, individuals are pigeon-holed by accident of birth into political units. (Cultural identity, like relatives, can't be chosen.)

Third, the codification necessitated by policy formulations reinforces beliefs in natural categories, as though some social group distinctions are primordial and related category differences essentially immutable. Results from recent experiments at Princeton University support this "cultural divide" hypothesis: A disagreement or difference of opinion between two individuals, if attributed to group differences, is perceived as more immutable and unresolvable than the same difference observed in an interpersonal context with no group attribution (Prentice, 1996). In this manifestation, multiculturalism becomes a disguised form of biological determinism.

A fourth issue revolves around who defines what cultural practices are representative of a social group. In the policy arena, it is usually political spokespersons who have a stake in mobilizing group members along particular symbols of cultural identity. By defining and codifying cultural practices as recognized at a particular point in historical time, such policies "freeze" the dynamic process of cultural evolution and change. For individuals and groups, identities naturally expand and contract across different functions and contexts. The fission-fusion model of social group boundaries is long-standing in anthropological theory, and such mutability is implicated by research on how readily individuals adopt context-specific ingroup-outgroup categorizations on the most minimal bases. Correspondingly, cultures have always changed, accommodated, merged, and differentiated over time and as a function of contact. Assimilation is not the problem; cultural hegemony is.

Finally, the belief that sustained positive regard and cooperative interdependence is possible between highly differentiated, monolithic groups is unrealistic. We know too much about "clique selfishness" and the power of social comparison to magnify even small differences in perceived access to resources, power, and control, to expect benign acceptance of differences, or trust in outgroups' intentions or

motives. Reified groups become the fault line for conflict and separatism. Social scientists rejected the separate-but-equal doctrine in the 1950s, and we have no reason to be sanguine about letting it re-emerge now.

A Resolution? Redressing Discrimination Without Reifying Groups

If social psychological research suggests, on the one hand, that group identities have to be acknowledged and respected, and on the other that group identities should not be politically institutionalized, what are the policy implications to be drawn from our discipline? If the assumptions underlying both assimilationism and multiculturalism are equally problematic, does social psychology have anything useful to say to policymakers?

There is an alternative to representing assimilationism and multiculturalism as two extremes along a single bipolar continuum. By taking a different perspective, the insights of recategorization, decategorization, and pluralism can be creatively combined. The key is to capitalize more effectively on our capacity for multiple social identities.

Structurally, societies can be differentiated along many cross-cutting partitions; and individuals have multiple, nonconvergent group memberships and social identities. To the extent that these group divisions are only minimally correlated, shared ingroup memberships and ingroup-outgroup differentiations on one occasion are realigned on others, when alternative identities are salient. If different identifications are meaningful and functional for individuals in different times and places, cross-cutting social categories reduce invidious social comparison, dilute social stereotypes, and motivate conflict prevention (Brewer, 1996; Marcus-Newhall et al., 1993).

Taking advantage of the capacity for multiple group identifications means redefining multiculturalism as a basis for individual identity rather than political policy. All individuals have multicultural heritage, and all of us are capable of juggling multiple identities across a lifetime (Seelye & Wasilewski, 1996). Cultural diversity is something we can experience as individuals, not just as a collective. Consider, for example, two different forms of policy promoting bilingualism. In one form, the differentiation of language communities is acknowledged and reinforced, and public policy requires that education, political participation, and public services be made available in all legally recognized languages so that they are accessible to speakers of either language. In an alternative form, bilingualism means that all members of the society are educated in both languages (or more) so that bilingualism is a shared cultural achievement at the individual, rather than just societal, level.

Similar examples can be given for the meaning of multicultural education. Consider the difference between curricula and practices that teach children to think of each other as representatives of distinctly different cultural communities, com-

pared to those that have the goal of teaching children to become experts in more than one culture. The former promotes cultural divisiveness, the latter multiculturalism as a shared value.

Concluding Perspectives

Policymakers don't often think of themselves as dictating social identities, but structural arrangements and legal institutions can greatly influence how identities are defined and whether lines of social differentiation in a society are correlated or uncorrelated. Situations in which social differentiations based on ethnicity, gender, age, religion, occupation, political power, and economic roles are all cross-cutting, require patterns of interdependence and accommodation that promote integration and individual multiculturalism. Situations in which distinctions based on gender, ethnicity, class, and power are convergent set the stage for division along a single societal fault line.

From this perspective, we can advise policymakers that discrimination is still the real issue for intergroup relations. When ingroup bias is permitted to express itself in discriminatory practices in legal, political, and economic arenas, different bases of social identity become progressively more correlated across time. Social policies should be aimed at reducing correlations between social categories and social roles, wealth, and power. We should approach cultural hegemony in much the same way that we respond to business monopolies in the economic arena. Affirmative action policies, for example, can be understood not as group entitlements but as reasoned mechanisms for reducing the historically cumulated correlations between demographic identities and economic and political role identities in our society. Structural changes in the pattern of relationships among social identities is a necessary precondition for achieving the benefits of any capacity for multiculturalism.

It would be naive to assume that social change can be accomplished without coordinated, collective efforts. Social change movements have always depended upon leaders who can mobilize individuals in the name of shared group interests, and group interest politics is both necessary and desirable for democratic societies. What has to be critically examined is the nature of the agenda of the collective movements—whether they are directed toward the larger, long-term interests of the individual members of the group or toward the maintenance of power enclaves.

What we should advocate is not a world in which group distinctions and cultural differences are denied or suppressed, but one in which meaningful social identities are contextualized—where neither accidents of birth nor choices of lifestyle limit access to other social identities; where being black has no more and no less social meaning than being a social psychologist.

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